

Patterns and Trends in Subsistence Fish Harvests, Northwest Alaska, 1994–2004

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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative Code	AAC	<i>all standard mathematical signs, symbols and abbreviations</i>	
deciliter	dL	all commonly-accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	alternate hypothesis	H _A
gram	g			base of natural logarithm	e
hectare	ha			catch per unit effort	CPUE
kilogram	kg			coefficient of variation	CV
kilometer	km	all commonly-accepted professional titles	e.g., Dr., Ph.D., R.N., etc.	common test statistics (F, t, χ^2 , etc.)	
liter	L			confidence interval	CI
meter	m			correlation coefficient (multiple)	R
milliliter	mL	at	@	correlation coefficient (simple)	r
millimeter	mm	compass directions:		covariance	cov
		east	E	degree (angular)	°
		north	N	degrees of freedom	df
		south	S	expected value	E
		west	W	greater than	>
		copyright	©	greater than or equal to	≥
		corporate suffixes:		harvest per unit effort	HPUE
		Company	Co.	less than	<
		Corporation	Corp.	less than or equal to	≤
		Incorporated	Inc.	logarithm (natural)	ln
		Limited	Ltd.	logarithm (base 10)	log
		District of Columbia	D.C.	logarithm (specify base)	log ₂ , etc.
		et alii (and others)	et al.	minute (angular)	'
		et cetera (and so forth)	etc.	not significant	NS
		exempli gratia (for example)	e.g.	null hypothesis	H ₀
		Federal Information Code	FIC	percent	%
		id est (that is)	i.e.	probability	P
		latitude or longitude	lat. or long.	probability of a type I error (rejection of the null hypothesis when true)	α
		monetary symbols (U.S.)	\$, ¢	probability of a type II error (acceptance of the null hypothesis when false)	β
		months (tables and figures)	first three letters (Jan,...,Dec)	second (angular)	"
		registered trademark	®	standard deviation	SD
		trademark	™	standard error	SE
		United States (adjective)	U.S.	variance	
		United States of America (noun)	USA	population	Var
		U.S.C.	United States Code	sample	var
		U.S. state	two-letter abbreviations (e.g., AK, WA)		
Weights and measures (English)					
cubic feet per second	ft ³ /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
Time and temperature					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
Physics and chemistry					
<i>all atomic symbols</i>					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity (negative log of) pH					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				
		Measures (fisheries)			
		fork length	FL		
		mid-eye-to-fork	MEF		
		mid-eye-to-tail-fork	METF		
		standard length	SL		
		total length	TL		

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NORTHWEST ALASKA, 1994–2004**

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Technical Paper series reports are available through the Alaska State Library and on the Internet: <http://www.adfg.alaska.gov/sf/publications>. This publication has undergone editorial and professional review.

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ABSTRACT

This project explored patterns and trends in subsistence fish harvests from 1994 through 2004 in 6 Northwest Alaska communities: Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak. The project involved a coordinated analysis of 2 related datasets: a community time series dataset in which each record contained a single year of fish harvest data for a single community, and a household panel dataset in which each record contained a single year of fish harvest data for a single household. The household panel data were supplemented with additional data from 92 selected households acquired during interviews. The strongest trend identified in the analysis was a declining harvest of chum salmon *Oncorhynchus keta*, -6.9% annually ($r^2=0.402$, $P=0.036$). Total subsistence fish harvests showed no trend ($r^2=0.045$, $P=0.612$), because increasing harvests of sheefish *Stenodus leucichthys* and Dolly Varden *Salvelinus malma* supplanted chum salmon. Possibly because households were targeting sheefish and Dolly Varden, use of setnets declined during the study period while use of rods and reels increased. Harvests of salmon other than chum salmon increased during the period, although only the trend in pink salmon *O. gorbuscha* was statistically significant ($r^2=0.390$, $P=0.040$), possibly providing evidence of expanding salmon range. In interviews with 92 selected fishing households, environmental factors, such as “unusual water levels” and “unusual weather,” were most frequently named as affecting fishing, and accounted for 34% of reported factors. Personal factors, such as health and age of the household members, accounted for 21%, while financial factors, such as employment and rising costs, accounted for 19% of reported factors. The data described a stable subsistence fishery, not without interannual variation, and not without shifts in species selections, but stable in the sense that residents continued to harvest almost exactly the same amount of fish per person over a decade’s time.

Key words: subsistence fishing, chum salmon, *Oncorhynchus keta*, sheefish, *Stenodus leucichthys*, whitefish, *Coregonus* spp., Dolly Varden, *Salvelinus malma*, Ambler, Kiana, Kobuk, Noatak, Noorvik, Shungnak, Kotzebue District, Cape Krusenstern National Monument, Kobuk Valley National Park, Kotzebue Sound, Noatak National Preserve.

1 INTRODUCTION

This project explored patterns and trends in subsistence fish harvests in 6 Northwest Alaska communities: Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak (Figure 1-1). The goal was to identify factors associated with changes in fish harvests in project communities, and to distinguish changes related to social, economic, and environmental factors from changes related to fisheries management. The project relied in part on analyses of previously collected subsistence fish harvest data to explore trends in harvests at the community level and patterns in harvests at the household level. The project also relied on interviews with selected fishing households. Respondents were asked to review and comment on factors affecting their household’s and community’s subsistence harvests. The results are expected to improve the reliability of predictive modeling regarding the subsistence harvest of fish.

The 6 study communities and their fisheries are similar: small, remote, subsistence-dependent communities with strong *Iñupiaq* traditions organized around extended families. Five study communities—Ambler, Kiana, Kobuk, Noorvik, and Shungnak—are on the Kobuk River, which drains the mostly forested southern slopes of the western Brooks Range. One study community—Noatak—is on the Noatak River, which drains the mostly unforested northern slopes of the western Brooks Range. Both rivers drain into Kotzebue Sound near Kotzebue. There are no local in-river commercial fisheries. For subsistence harvests, residents rely on gillnets, seine nets, and rods and reels.

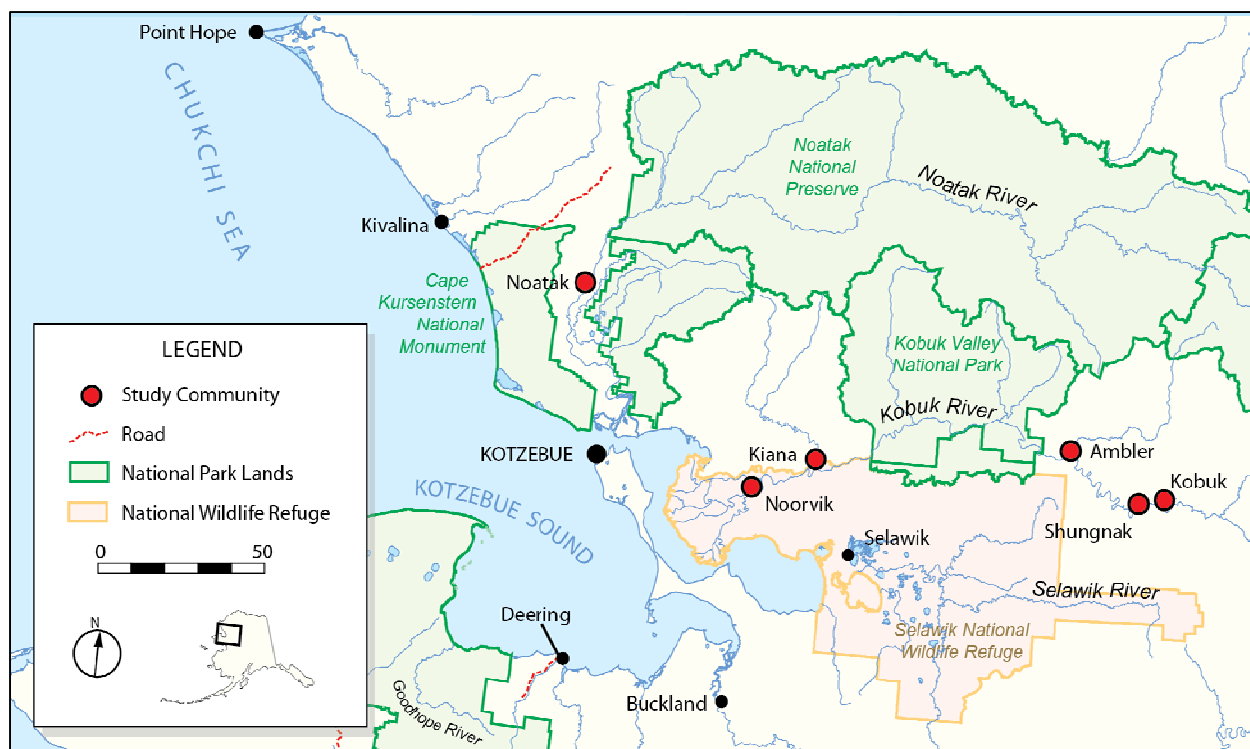


Figure 1-1.—Map of Northwest Alaska, showing the 6 study communities.

THE RESEARCH PROBLEM

From 1994 through 2004, estimated harvests of Pacific salmon *Oncorhynchus* spp. decreased in each of the 6 project communities. The moving 4-year average of the communities' total salmon harvest declined from 42,987 salmon in 1997 to 25,327 salmon in 2004 (Magdanz et al. 2008). In some communities, declines in harvests of salmon have been mitigated by increases in harvests of other fish, but in other communities this has not occurred. The reasons for these changes in harvests, whether ecological, social, or economic, are not well understood.

LITERATURE AND DATA REVIEW

From 1994 through 2004, many environmental and economic changes were occurring in the study area. Widespread salmon run failures in Western Alaska in the 1990s were blamed on anomalous ocean conditions (Kruse 1998). At the same time, the international market for commercially-caught wild salmon collapsed. From 1993 to 1997, inflation adjusted, exvessel dollar values of salmon in the Arctic–Yukon–Kuskokwim (AYK) region of Alaska were the lowest since 1976 (Buklis 1999). Many rural AYK families use income from small scale commercial salmon fisheries to purchase subsistence equipment and supplies. “Low salmon harvests coupled to depressed prices have created substantial economic and social hardships in the affected communities” Buklis (1999) observed. By 1998, the “severe economic and social hardships” resulting from the depressed salmon fisheries had prompted Alaska’s governor to request a federal disaster declaration (Kruse 1998).

Throughout the study period, fuel prices were increasing and by 2008 exceeded \$8.00 per gallon in some Northwest Alaska communities. This limited people’s ability to travel to hunt and fish, and increased the costs of imported food, equipment, and supplies. Until the global recession began in 2008, high oil prices increased state oil revenues and employment (Fried and Robinson 2008), while high prices for zinc, gold,

and other metals encouraged mineral exploration and extraction activities in Northwest Alaska, and provided new sources of employment.

Atmospheric warming is producing rapid changes in Alaska's environment (Chapin III et al. 2004; Hassol 2004; Overland and Stabeno 2004). Changes in the Northern Bering Sea "may have profound impacts on Arctic marine mammal and diving seabird populations as well as commercial and subsistence fisheries" (Grebmeier et al. 2006:1463). As an example, northern lakes and rivers have been freezing later and breaking up earlier (Magnuson et al. 2000), which may affect the movements of both animals and people, and disrupt seasonal patterns of subsistence harvesting and processing (Hinzman et al. 2005). Rural families are reporting that these economic and environmental changes are forcing them to reconsider how to spend their limited resources and time: when to go to fish camp and how long to stay; whether to purchase new fuel efficient, 4-cycle outboard motors or continue to use less expensive, 2-cycle motors; whether to take a job in the mining industry, or to rebuild a camp washed away in the spring flood. Environmental and economic changes are also increasing challenges for fishery managers, as it becomes more difficult to predict salmon returns, commercial markets, fishing effort, and fishing harvests.

Given the accumulating impacts of economic and environmental changes in the Northwest Arctic, time-series analyses of subsistence harvests were an obvious line of inquiry. For the 6 Northwest Arctic communities in this project, the available data may be unique in 2 ways: 1) household subsistence harvest records include not only all 5 of the Pacific salmon species found in Alaska but also 3 other major fish species; and 2) consistent annual household identification codes allow time-series analyses at the household level. Consequently, researchers can explore relationships over time among the subsistence harvests of major fish species—salmon, sheefish, Dolly Varden, and whitefishes *Coregonus* spp.—at the household level.

Prior surveys showed that residents of the 6 Northwest Arctic communities harvested an estimated average of 90,000 fish annually from 1994 through 2004. Converting numbers of fish to estimated pounds of fish using standard ADF&G conversion factors (Appendix Table A-5), fish contributed an estimated average edible weight of almost 400,000 lb to annual subsistence harvests in the 6 study communities: almost half of the total estimated subsistence harvest of all wild foods, by weight. A substantial proportion of fish harvest effort occurred within the boundaries of the Kobuk Valley National Park, the Noatak National Preserve, and the Cape Krusenstern National Monument.

A previous analysis of patterns and trends in salmon harvests for 10 Seward Peninsula communities examined several hypotheses about factors related to salmon harvests (Magdanz et al. 2009). Results were consistent with subsistence harvest patterns observed by other researchers. A relatively small portion of predominantly Alaska Native households typically produced most of the wild foods, by weight, harvested within a given community. These highly productive households typically included multiple working age males, were involved in commercial fishing, and had higher wage incomes. Given these patterns, it was reasonable to assume that in each community there existed a stable core of high harvesting households that took the majority of the salmon year after year. Wolfe was among the first to describe this phenomenon, and coined the term "super-households" (Wolfe 1987).

The analysis of the Norton Sound salmon harvest data suggested that the "super-households" could not be fully understood by analyzing single-year datasets. Norton Sound researchers found that while some high-harvesting households consistently contributed to the community harvest, other households' contributions were unpredictable (Magdanz et al. 2005:61–66). Surprisingly, some households that fished on an intermittent basis were among the highest harvesting households in their communities, in a given year (Magdanz et al. 2005:52–53).

In the Norton Sound project, researchers based their analyses primarily upon the harvest database and attributes of each household collected from other databases or provided by key respondents. While patterns and trends could be observed in the data, explanations for those patterns and trends were speculative (Magdanz et al. 2005:75). Changes in community harvests are the result of changes in

harvests by individuals and families. Fishing families themselves are best able to explain changes in their own fish harvests, which is why this project relied on both household harvest records and on interviews with selected fishing families in the study communities.

RESEARCH QUESTIONS

Based on a review of the literature and data, a series of research questions was developed to further clarify patterns and trends in subsistence harvests of salmon, whitefishes, sheefish, and Dolly Varden in Northwest Alaska. The first set of questions explored trends in fisheries harvests, specifically:

1. How did subsistence fish harvests change in the 6 project communities from 1994 through 2004?
2. What factors might account for these changes?
3. What factors might account for differences observed among the 6 project communities?

A second set of questions explored patterns in fishing harvests:

1. Why do some households, and not others, cycle in and out of the fisheries?
2. Why do some intermittently fishing households harvest large quantities when they do fish?
3. Why are intermittently fishing households more common in some communities?

OBJECTIVES

This project had 6 objectives which addressed the 6 related research questions:

1. Compare community and household harvest databases; identify and correct data errors.
2. Analyze the community database to identify harvest trends for 4 fish species in 6 communities.
3. In 2 communities, work with high school students to review community harvest patterns and trends and work with respondents in selected households to review household harvest patterns and trends.
4. In 6 communities, collect household attributes (age of heads of household, changes in health status, deaths, marriages, etc.) from key respondents and through household interviews.
5. Summarize data from interviews and add household interview data to the harvest database.
6. Analyze the household database to identify correlations between harvests and social, economic, and demographic variables.

2 METHODS

The project design involved a coordinated analysis of 2 related datasets, both of which contained fish harvest reports and estimates previously collected during 11 years of post-season salmon surveys, supplemented with additional data collected during this project. The first dataset was a community time series dataset in which each record contained a single year of fish harvest data for a single community. The second and much larger dataset was a household panel dataset in which each record contained a single year of fish harvest data for a single household. Within the household dataset was a balanced panel of households: that is, data were available every year for each household. The household panel data were supplemented with additional data from selected households acquired during interviews conducted by staff from Maniilaq Association and the Alaska Department of Fish and Game (ADF&G), and by high school students in Noatak and Shungnak.

The project was conducted in 3 phases. In the first phase, researchers merged the annual household harvest data sets, compared them with the existing community data set, and corrected errors and omissions. They then identified trends in community harvests. In the second phase, researchers returned to the study communities with the merged household harvest data, the community summary data, and the harvest trends analyses. They shared these results with selected households during a series of face-to-face interviews, and sought explanations for the patterns and trends observed in the data. In the third phase, researchers added data from the household interviews to the household harvest data set, and conducted a final round of analyses.

PROJECT MATERIALS AND INSTRUMENTS

Prior to data collection, researchers developed several project materials and instruments (Appendix B). They created a brochure to explain the project to community councils, to high school staff and students, and to potential respondents. For each potential respondent household, they assembled a 2-page household fishing history summarizing that household's annual reported harvests in numbers and pounds of each species of fish, as well as each community's total estimated harvests during the same period. These histories were used as prompts during household interviews. Researchers developed 2 instruments to collect data during interviews. The first was a 5-page interview protocol used to collect information from fishing households about factors that affected their fishing. The second instrument was a 1-page household data verification and collection sheet. This was used during key respondent interviews to determine which households had a unique identification number across 11 years of data collection, to flag households with multiple identification numbers for correction if possible, and to collect additional information about each household, such as the age of the household head. This process is described in more detail in Data Collection and Reduction below.

SAMPLES

Two samples were used for this project: 1) the annual samples of 191 to 446 households contacted in the original harvest surveys, and 2) a subsample of 92 of households re-interviewed for this project (Table 2-1). To ensure that interviewed households could provide data relevant to changes in harvests, a household was considered for interviews only if it 1) had been surveyed at least 6 times in the 11-year survey period; 2) had actually harvested fish in at least 1 year in the 11-year survey period; and 3) had a consistent household identifier so that a panel dataset could be constructed. In the 6 study communities, 243 households met these eligibility standards (Table 2-1).

Table 2-1.—Survey and interview samples.

	Original harvest survey project (1994–2004)												Median sample	This project (2007–2011)		
	Number of households surveyed													N of households		Sample fraction
	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	Total		Eligible ^a	Included	
Core study communities																
Shungnak	52	44	51	47	50	28	34	39	51	33	47	476	84%	33	25	76%
Noatak	68	76	74	75	90	14	61	67	90	103	103	821	84%	68	37	54%
Subtotal	120	120	125	122	140	42	95	106	141	136	150	1,297	84%	101	62	61%
Other study communities																
Ambler	29	68	80	69	73	21	34	0	0	62	60	496	83%	28	9	32%
Kiana	59	76	88	86	88	67	51	66	0	90	77	748	76%	42	9	21%
Kobuk	22	23	22	22	25	13	15	24	0	23	28	217	85%	11	2	18%
Noorvik	64	103	111	114	109	48	42	56	101	135	125	1,008	84%	61	10	16%
Subtotal	174	270	301	291	295	149	142	146	101	310	290	2,469	84%	142	30	21%
Total	294	390	426	413	435	191	237	252	242	446	440	3,766	84%	243	92	38%

a. For the original survey, an “eligible” household was any occupied household in the community. For this project, an “eligible” household was a household that was a) surveyed in at least 6 of the 11 survey years, b) actually harvested fish in at least 1 year, c) had a consistent household identifier, and d) was present in the community in 2008.

Although regional harvest surveys were conducted every year, only 3 of study communities (Noorvik, Noatak, and Shungnak) were surveyed in each of the 11 years from 1994–2004. In 2001, annual salmon surveys were not conducted in Ambler. In 2002, surveys were not conducted in Ambler, Kiana, and Kobuk. In Ambler in 1994 and in Noatak in 1999, fewer than 30 households were surveyed. Division standards require a minimum of 30 households to calculate expanded estimates of harvest. So in those 2 instances, expanded estimates were not calculated. During the study period, ADF&G operated a test fishery in Kiana, and distributed the catch in the community, contributing about one-third of the community's total salmon harvest. These factors influenced the decision not to select Ambler, Kiana, or Kobuk as core study communities.

Research efforts were concentrated in Noatak and Shungnak, because they had been surveyed every year, were on 2 different river systems, and had comparable comprehensive survey data. In these 2 core study communities, the goal was a 50% random sample of eligible households. In the 4 other study communities (Ambler, Kiana, Kobuk, Noorvik), the goal was a 5% random sample of eligible households. As a practical matter, the sample was limited to households still present in the communities in 2008. Sampling goals were achieved in all 6 study communities. In the 2 core study communities, 62 of 101 eligible households (61%) were interviewed. In the 4 other study communities, 30 of 142 eligible households were interviewed (21%).

LIMITATIONS AND ASSUMPTIONS

The surveys included 5 Pacific salmon species: Chinook, chum, coho, sockeye, and pink salmon. In Kobuk River communities, the survey also included sheefish, and in Noatak, Dolly Varden. Beginning in 1997, whitefish were included in every community. Beginning in 2003, Dolly Varden were included in every community. The study communities harvested other fish species that were not documented by the annual salmon survey. In addition, the study communities also relied substantially on caribou, moose, seals, and whales: these harvests were not included in this project. The selection of included fish species was supported by results of comprehensive surveys in Noatak, Kiana, and Shungnak, which indicated that the selected species comprised a majority of the fish harvest in the study communities. The study species comprised 94% of estimated edible weight of the fish harvest (Figure 2-1A) and 47% of the estimated edible weight of the total subsistence harvest (Figure 2-1B).

In the study communities, most salmon, whitefish, sheefish, and Dolly Varden are harvested during months of open water; i.e., from June through September. Salmon harvest surveys usually were conducted in October and November, several months after most harvests occurred. Some fish (especially Dolly Varden in Noatak) were caught after freeze up and some were caught in the months immediately *after* the survey. Very few people in the Kotzebue District recorded their fish harvests on a daily or weekly basis. When reporting summer harvests during fall surveys, virtually all respondents had to rely on memory and provide estimates. Harvests from the previous winter, especially, may not have been reported at all. However, picking nets, cutting fish for drying, hanging fish on drying racks, and storing fish in caches and freezers provide multiple opportunities to count catches, and people did count fish (“we had 14 salmon in our net this morning”).

Most households in the study communities produced, processed, and distributed wild foods within family-based networks of cooperating households (Magdanz et al. 2002). Surveys were administered one per household, and harvests were reported at the household level. Efforts to accurately report any given household's harvests may have been confounded by cooperative fishing involving groups of households.

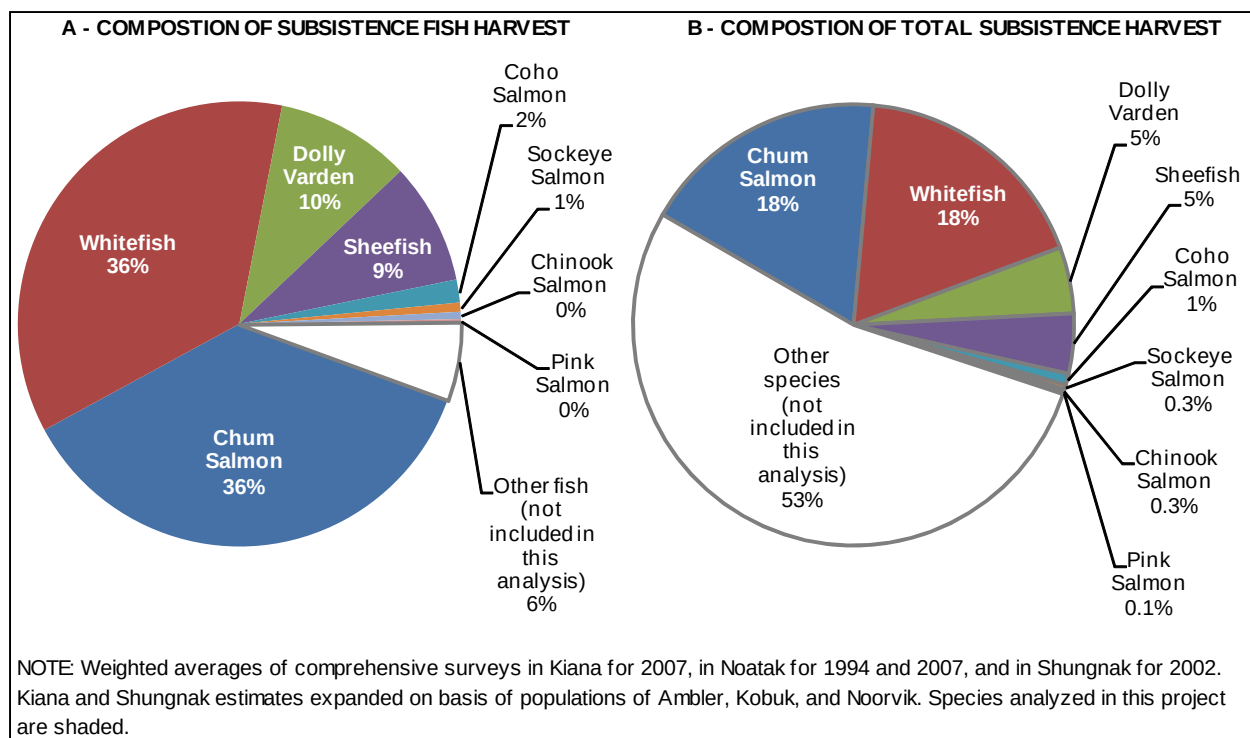


Figure 2-1.—Composition of subsistence harvests.

The household survey method assumed that respondents could remember their households' subsistence harvests from the recent past. To minimize recall problems, surveys were conducted with household heads on the assumption that household heads were most likely to be aware of all household members' activities. The survey method also assumed that respondents were knowledgeable about the quantities of fish harvested by others in their households, and were able to parse harvests by members of their household from harvests by other households in their cooperative fishing groups. Survey forms anticipated cooperative harvests and included instructions and questions to assist respondents in correctly parsing harvests.

In part because of the lag time between harvests and survey reports and in part because harvest quantities could be large, respondents frequently reported harvests in quantities divisible by 5, 10, 25, and 100 (Figure 2-2A). For households reporting 100 or fewer chum salmon in these data sets, harvest quantities divisible by 5 were reported 4 times as often, harvest quantities divisible by 10 were reported 6 times as often, and harvest quantities divisible by 25 were reported 7 times as often as would be expected if quantities were randomly distributed. All other harvest quantities (less than 100 salmon) were reported only 1/10th as often as would be expected. Households harvesting 10 or fewer salmon did not display this heaping pattern. Households harvesting more than 100 salmon typically rounded to the nearest 100 salmon. Especially for whitefish, households that harvest large quantities of fish may report quantities other than individual fish, such as 15-gallon washtubs and 100-lb gunny sacks. The assumption was that while households may not have reported precisely how many fish they harvested, they did report the magnitude of their harvests correctly. Presumably, households that harvested 7 or 12 fish may have reported 10 fish, and households that harvested 623 or 774 fish may have reported 700 fish, but households that harvested 326 fish did not report 75 fish. The observation was that precision declined as harvest quantities increased. The assumptions were that the rounded estimates were valid, and that their precision was adequate for the analyses in this study.

In most small, rural, subsistence-dependent communities in Alaska, approximately 30% of the households harvested 70% of the wild foods (Wolfe 1987, Wolfe et al. 2009). Not only have a few super-households

accounted for a majority of the community harvest, many households have reported zero harvests of individual species, and some have reported no subsistence harvests at all. As an example, 47% of the households surveyed in the study communities from 1994 to 2004 reported harvesting no chum salmon at all. Aside from the zero-harvest reports, the distribution of harvests was log-normal (Figure 2-2B), although heaping was still evident for 10, 25, 50, 75 and 100 fish. The preponderance of zero-harvest households, the heaped responses, and the log-normal distribution of harvests have been typical features of subsistence harvest data from small, rural Alaska communities. These factors, and the relatively small size of the communities, increased the potential for biased samples, so the annual salmon survey project attempted to survey all eligible households in each community. The actual median sample was 84%. In addition, the annual survey project employed a 2-strata design: households that “usually fish” and households that “usually do not fish.” A sample biased towards one stratum or the other should not adversely affect community estimates.

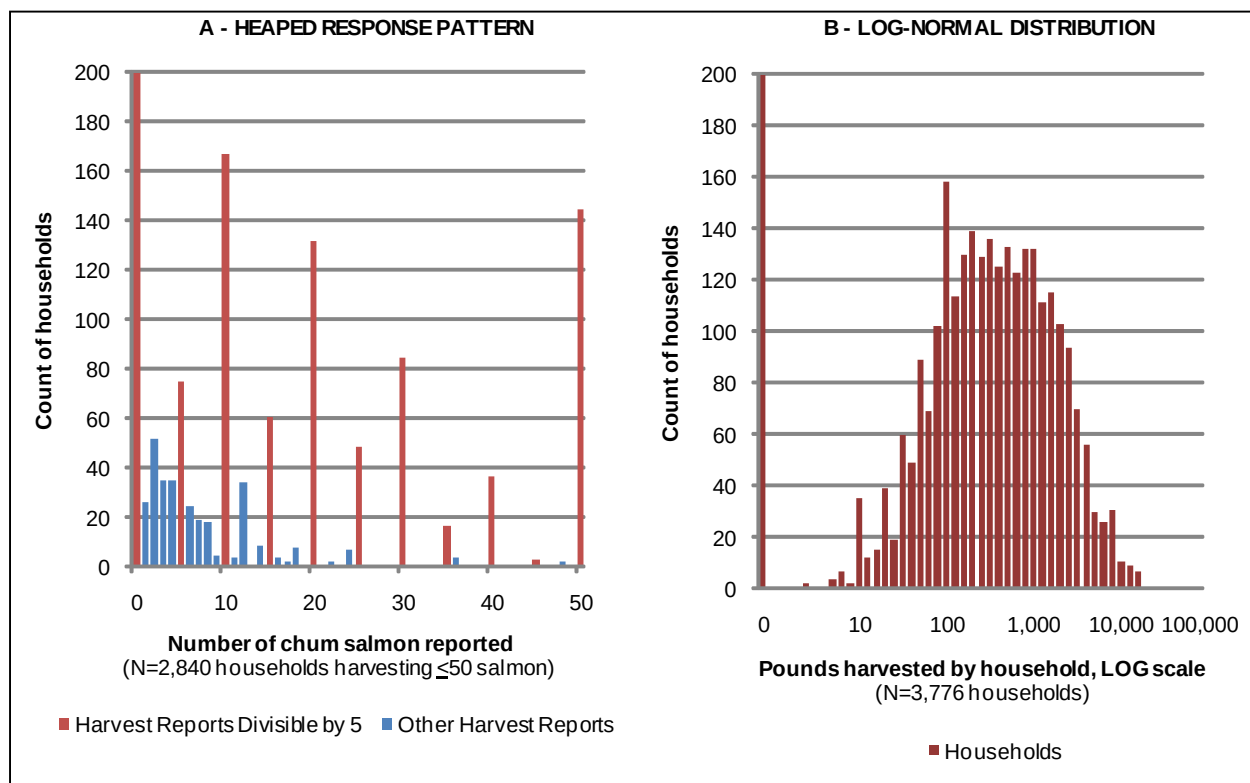


Figure 2-2.—Heaping and distribution of reported harvests.

There were minor differences in the annual data collection instruments from 1994 through 2004 (see original instruments in Appendix C). For 2 communities (Noatak 1994 and Shungnak 2002), data used in this project were collected with comprehensive surveys administered in the winter rather than with annual salmon surveys administered in the fall. To assess the comparability of data from the 2 instruments, researchers compared results from 4 comprehensive surveys (Noatak 1994, Shungnak 2002, Kiana 2006, and Noatak 2007) with results from the annual surveys. All the estimates from the comprehensive surveys were within the ranges of annual estimates. For salmon, 2 of 4 comprehensive survey estimates were within 1 standard deviation of the annual survey estimates. For whitefish and sheefish, all the comprehensive survey estimates were within 1 standard deviation of the annual survey estimates. In Noatak, the annual survey data were bracketed by comprehensive surveys in 1994 and 2007 (Figure 2-3). Because only 11 years of data were available, adding or removing a single year’s estimate usually

affected trend calculations. Adding or removing comprehensive survey estimates did affect the magnitude of trends, but no more so than adding or removing estimates from the annual surveys. Estimates from comprehensive surveys were included in the analyses in this study. The assumption was that estimates from both survey programs were similarly precise and valid.

Standardization in data collection procedures was important because many different people gathered data. The annual survey data collection was supervised and often conducted by an ADF&G employee. Original survey data were reviewed before data entry by the project manager, and subjected to multiple reviews after data entry and before final publication. An extensive review and correction of the raw harvest data set was one of the objectives (and most time consuming aspects) of this project. In this project, one of the principal investigators was present during, and typically conducted, most of the household interviews.

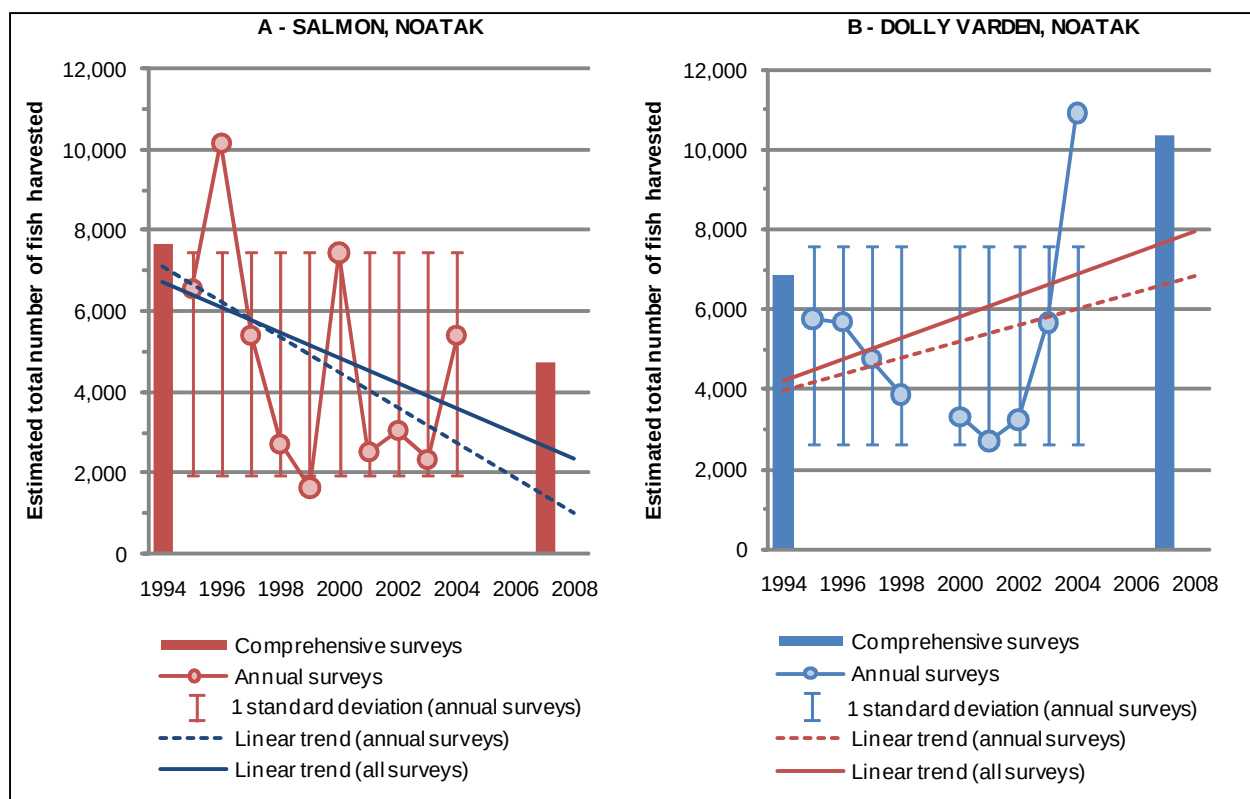


Figure 2-3.—Comparisons of annual and comprehensive survey estimates, 1994–2007.

These limitations and assumptions were typical of subsistence harvest surveys in Alaska. They were not expected to change significantly over time or from community to community. They were not expected to affect comparisons of data in this study, or comparisons of data from this study with other studies employing similar methods.

Chum salmon, sheefish, Dolly Varden, and whitefish were generally abundant in the Kotzebue District, though not uniformly distributed. Other salmon species were uncommon. The Kobuk River supported “strong” stocks of chum salmon (Banducci et al. 2007) and sheefish (Taube and Wuttig 1998), and smaller stocks of Dolly Varden. The Noatak River supported strong stocks of chum salmon (Banducci et al. 2007), and less numerous stocks of Dolly Varden (deCicco 2001). Stock status of whitefish was unknown, but they were obviously abundant (Georgette and Shiedt 2005). Aerial survey data for Kobuk River salmon 1993–2007 and Noatak River Dolly Varden 1981–1999 showed no substantial trends (Menard and Kent 2010, deCicco 2001). Reflecting generally abundant fish stocks and a long history of

subsistence use, subsistence fishing was open year round without harvest limits. Subsistence fishing regulations did not change during the study period. Therefore, the expectation was that any changes in subsistence harvest patterns and trends would not be related to fish abundance or fishing restrictions, but to social, economic, or environmental factors.

DATA COLLECTION AND REDUCTION

Figure 2-4 illustrates data collection and reduction in schematic form. The harvest data had been collected from 1994 through 2004 during annual salmon surveys, and were stored in a series of 11 annual data files. Each year, the department published the results of the annual surveys as part of a statewide salmon harvest report; the community harvest data set summarized these community-level harvest reports. In the first phase of the project, researchers combined the annual data files into a single household harvest data set with 3,766 household harvest reports. They cleaned and restructured the data, and verified the data by comparing harvest totals from the newly constructed 11-year household harvest data set with the harvest totals previously reported in the statewide reports (Objective 1).

The results of the comparisons are summarized in Appendix Table A-3 to Appendix Table A-8. The household harvest data set agreed with the community harvest data set in 400 of 416 reported harvest comparisons (96%). The 11-year total harvest in the community data set was 752,869 fish, compared with 753,485 fish in the household data set, a difference of 0.06%. In most cases, the differences appear to be the result of adding cases to the household harvest data set, which happens occasionally when households return surveys by mail after the door-to-door surveys have been completed. Surveys returned by mail are sometimes too late to be included in the annual reports. When researchers were confident that differences between the community and household harvest data sets had been corrected or explained, or were not significant, researchers continued with their analyses.

Researchers next analyzed trends in the harvests of each species in each community; the results are summarized in the results section (Objective 2).

In the second phase of the project, researchers visited each project community to verify household identifiers, to gather household characteristics data (which supplemented each household's harvest data), and to conduct interviews with eligible fishing households. To prepare for each community trip, researchers printed 2 summary tables containing the numerical household identifiers (household IDs) and the household names that ADF&G had used in each project community in each year. One table was sorted by household ID and the other table was sorted by the head of household's last name. Researchers also printed summary tables showing the age of every person in the household, grouped by household, according to Alaska permanent fund records from the year 2000. In each community, researchers and 1 (or more) key respondents reviewed both tables to verify that ADF&G's numerical household codes were consistent for each household from year to year. If this review determined that a household had been surveyed under different codes in different years (as would happen if household members left a community for more than 1 year and then returned), the household ID was flagged for correction in the database.

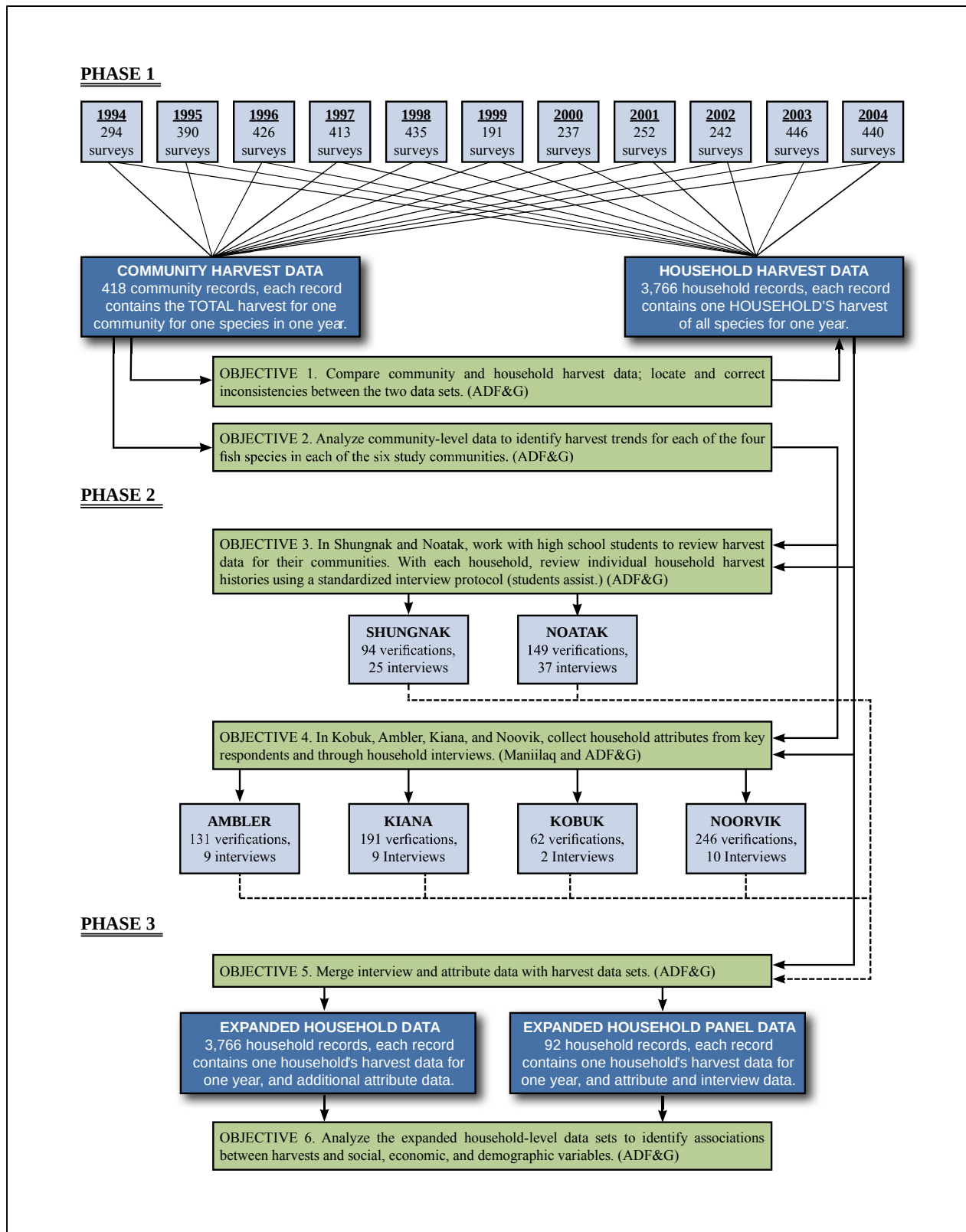


Figure 2-4.—Relationships of data sources and data sets to project objectives.

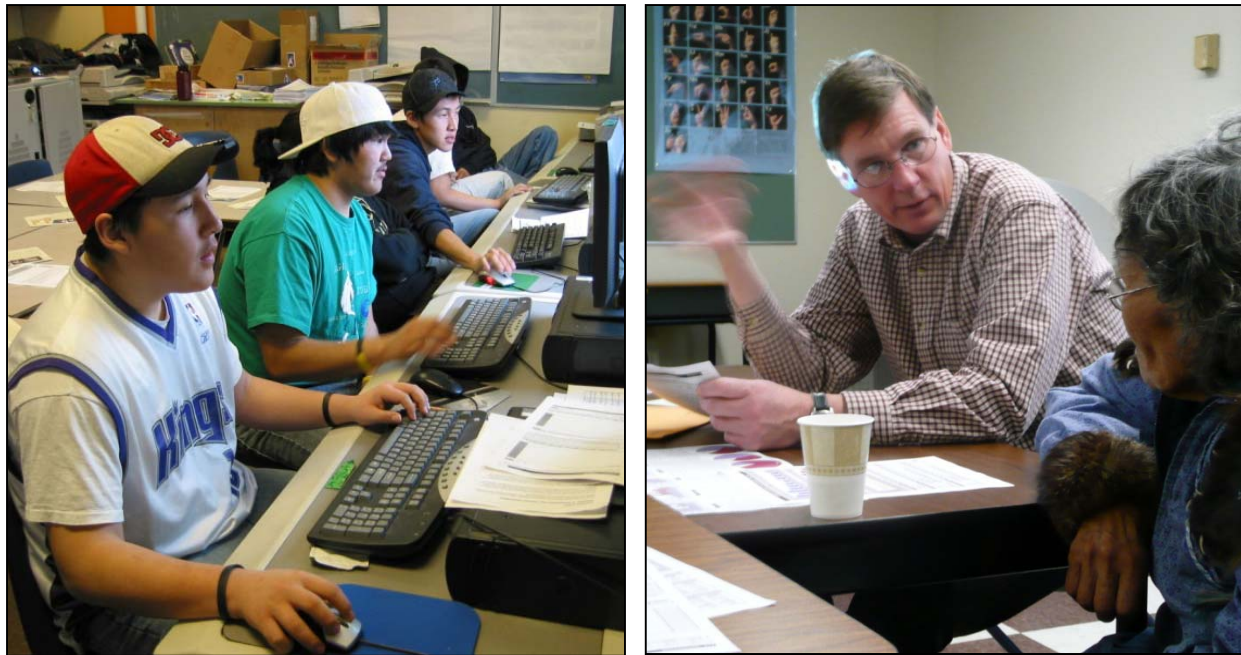


Figure 2-5.—Noatak students work with fisheries data files (left). Researcher James Magdanz interviews elder Mildred Black during a workshop for Shungnak students (right).

DATA ANALYSIS

In the third phase of the project, researchers used Microsoft Excel™ to prepare household interview data for analysis, and to prepare quantitative data from the interviews for merging with the Statistical Program for the Social Sciences™ (SPSS) harvest datasets. Researchers then merged the aggregated harvest data set from phase 1 with the household characteristics and interview data sets from phase 2 (Objective 5), using SPSS.

The annual and community harvest data sets contained reported and estimated harvests as numbers of fish. Fish of different sizes—3-pound whitefish, 8-pound salmon, and 16-pound sheefish—required a standard unit for cross-species comparisons. Researchers converted numbers of individual fish to edible pounds of fish using a table of standard conversion factors (Appendix Table A-2). Occasionally harvest reports were provided as volumes of fish rather than numbers of fish; for example, 15-gallon metal washtubs of whitefish. Original harvest reports in unorthodox units (e.g., tubs, sacks) had been converted to numbers of fish in previous analyses (Georgette 1996a, 1996b; Georgette, Caylor, and Tahbone 2003a, 2003b; Georgette, Caylor, and Trigg 2001; Georgette and Koster 2005; Georgette and Utermohle 1997, 1998, 1999, 2000, 2001, Magdanz and Utermohle 1994). Although they were not used in the analyses in this study, conversion factors for unorthodox units are also included in Appendix Table A-2. Footnotes explain the basis for the conversion factors, the sources for the conversion factors, or both the basis and sources for the conversion factors.

SPSS was used to compute, recode, categorize, and transform variables for analysis, and to test for associations between harvests and factors reported as affecting fish harvests. Excel was used for trends analysis, and to prepare the tables and figures for the report. Trends were evaluated with the square of the Pearson product moment correlation coefficient (RSQ function in Excel). Findings were considered significant at the 0.05 level ($P < 0.05$).

3 RESULTS

The results begin with a brief overview of the fishery: the fish caught, the gear used to catch them, and their uses for human consumption and for dog food. The second section discusses harvest trends and explores factors potentially associated with changing harvests. The third section presents analyses of the combined harvest-interview dataset.

Estimated fish harvests in the study communities ranged from 311,104 lb in 2001 to 559,029 lb in 1997. The average total annual harvest of all 8 surveyed fish species was 365,429 lb, or approximately 194.9 edible lb of fish per person per year. Three species comprised virtually all of the reported subsistence fish harvests. As was expected, harvests reflected fish distributions. In Kobuk River communities, chum salmon, sheefish, and whitefish comprised 99% of the reported subsistence fish harvest from 1994 through 2004 (Figure 3-1A). In Noatak, chum salmon, Dolly Varden, and whitefish comprised 97% of the reported subsistence fish harvest (Figure 3-1B). In most years, whitefish harvests were collected for Kobuk River communities, but not usually for Noatak. Conversely, Dolly Varden harvests were collected for Noatak, but not for Kobuk River communities (see Methods).

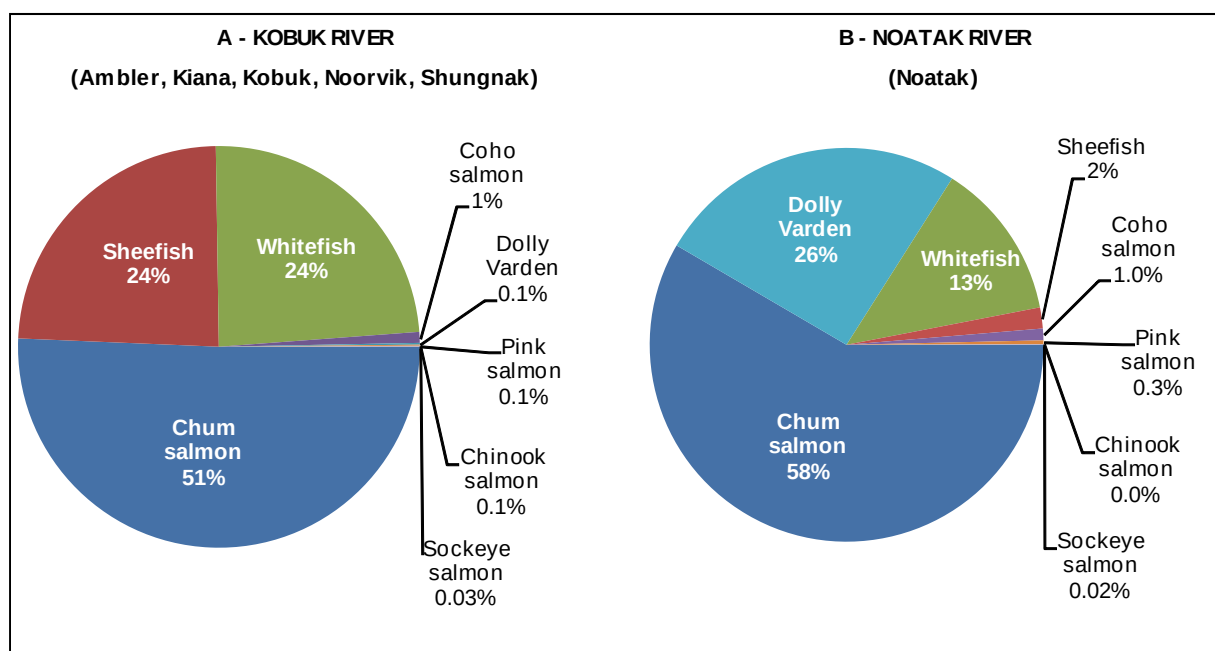


Figure 3-1.—Composition of fish harvests, Kobuk and Noatak River communities, 1994–2004.

Respondents were asked about the fishing gear used to catch salmon, but were not asked to apportion salmon harvests to any gear other than rod and reel (see surveys in Appendix C). Respondents were not asked about gear for other species. On average each year, 5,642 lb of salmon (3% of all salmon) were caught with rod and reel (Figure 3-2A). The remaining 173,623 lb of salmon (97%) were taken with other gear, primarily set gillnets and seines. There were 2 reports of use of drift gillnets, and no reports of use of dip nets. Fish wheels are not used in Northwest Alaska. Respondents were asked how many salmon they caught specifically for use as dog food (not including spoiled fish and table scraps). About 10% of salmon (by edible weight) were caught specifically for dog food (Figure 3-2B).

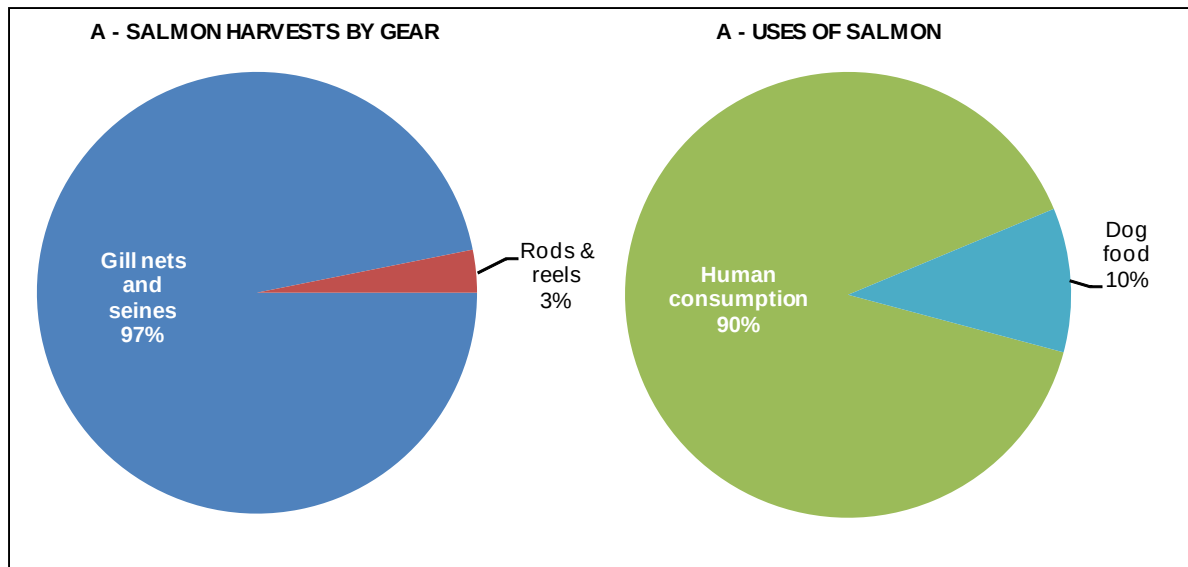


Figure 3-2.—Salmon harvests by gear type and salmon uses, 1994–2004.

TRENDS

Table 3-1 summarizes estimated harvests by year (in edible weight) for the 6 study communities. In this table, subtotals include only years when harvest estimates were available for all 6 communities. Totals include all harvests for all communities in all years, even years when estimates were not available for some species or for some communities. Trends were calculated for individual communities and for subtotals, but not for the totals because missing community estimates would affect the trend calculations.

An analysis of annual trends in the combined harvests in all 6 communities showed a modest declining trend in estimated total weight harvested (–2.8% change). However, considerable differences were observed among species and among communities. Estimated salmon harvests decreased by –5.1% annually (Table 3-1). Downward trends in estimated salmon harvests were observed in all communities, and varied from –9.9% annually in Shungnak to –1.0% annually in Noorvik. Estimated sheefish harvests were essentially unchanged over the study period, +0.8% annually, ranging from –1.1% in Kiana to +3.0% in Shungnak. In most years, Dolly Varden harvest data were only collected for Noatak. In Noatak, Dolly Varden harvest estimates trended upwards by +3.8%. Estimated whitefish harvests declined slightly overall, –2.9% annually. In contrast with other species, whitefish trends varied widely among communities. Estimated harvests of whitefishes in Kobuk increased by +30.9% annually (note, however, the limited number of estimates), and decreased by –10.9% in Kiana.

Table 3-1 illustrates not only trends in harvests, but also some limitations of the data sets. Annual harvest estimates for all 6 communities were available in only 5 of 11 years, less than half the study period. To deal with this limitation, researchers adopted 2 approaches. First, researchers focused on Noatak and Shungnak, which had more complete data sets. Second, researchers compared harvests per person rather than total harvests. In years when estimates for Ambler, Kiana, or Kobuk were missing, Noorvik and Shungnak provided reasonable proxies as the 5 Kobuk River communities relied on the same stocks of fish and exhibited similar harvest patterns. Whitefish were not added to the survey until 1997, so calculations of trends for both whitefish and all fish were limited to the years 1997–2004.

Table 3-1.—Trends in fish harvests.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Percent change per year ^a
Salmon (estimated edible pounds)												
Ambler		53,124	52,500	23,055	17,742	14,420	35,081			15,183	26,577	−9.6%
Kiana	26,668	24,264	7,668	14,923	21,078	14,734	7,081	20,421		12,325	14,489	−5.2%
Kobuk	52,934	25,819	1,661	3,954	7,596	17,456	3,081	22,368		15,024	27,507	−5.1%
Noorvik	77,913	49,723	54,738	132,742	67,660	120,892	75,852	108,191	97,589	53,516	40,370	−1.0%
Shungnak	69,359	23,185	57,105	44,176	35,249	23,882	18,711	28,409	27,453	18,318	26,925	−9.9%
Noatak	31,430	25,632	81,349	34,893	17,501		46,323	14,643	17,678	13,308	31,252	−7.3%
Subtotal ^b		201,747	255,020	253,743	166,825		186,130			127,673	167,121	−5.1%
Total	258,304	201,747	255,020	253,743	166,825	191,384	186,130	194,032	142,720	127,673	167,121	
Sheefish (estimated edible pounds)												
Ambler	34,783	22,912	13,590	17,621	10,742	21,511	19,059			8,471	26,437	0.5%
Kiana	9,731	15,836	11,434	14,572	6,525	7,495	7,929	13,681		10,430	11,970	−1.1%
Kobuk	8,899	9,447	5,127	9,276	4,526	6,995	2,546	368		9,042	13,885	1.3%
Noorvik	7,442	40,208	38,324	57,302	18,294	45,983	37,345	18,906	49,132	39,594	31,510	2.4%
Shungnak	15,375	18,230	10,532	12,768	20,905	26,137	9,688	10,796	23,031	23,692	16,826	3.0%
Noatak	1,114						1,399			23	798	
Subtotal ^c	76,230	106,634	79,007	111,539	60,992	108,122	76,567			91,229	100,628	0.8%
Total	77,343	106,634	79,007	111,539	60,992	108,122	77,966	43,752	72,162	91,252	101,426	
Dolly Varden (estimated edible pounds)												
Ambler										813	337	
Kiana										318	320	
Kobuk										0	66	
Noorvik										940	1,386	
Shungnak									290	321	485	
Noatak	15,305	16,908	18,784	15,718	12,778		10,938	8,917	10,697	18,711	35,498	3.8%
Subtotal	15,305	16,908	18,784	15,718	12,778		10,938	8,917	10,697	18,711	35,498	3.8%
Total^d	15,305	16,908	18,784	15,718	12,778		10,938	8,917	10,987	21,103	38,092	
Whitefish (estimated edible pounds)												
Ambler				31,610	6,985	58,095	73,748			30,130	11,834	−4.7%
Kiana				45,942	10,895	11,474	18,620	13,651		22,888	11,222	−10.9%
Kobuk				2,982	2,342	1,829	2,630			19,440	11,134	30.9%
Noorvik				64,811	35,021	64,699	32,804	36,202	47,644	33,968	26,882	−8.9%
Shungnak				27,722	19,169	20,237	14,748	9,919	45,413	38,212	20,817	5.7%
Noatak	6,077			4,963	9,071		5,594	4,630	6,131	9,212	17,854	8.4%
Subtotal ^l				178,029	83,483	175,969	148,144			153,852	99,744	−2.9%
Total	6,077			178,029	83,483	156,334	148,144	64,403	99,188	153,852	99,744	

- continued -

Table 3-1.–Page 2 of 2.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Percent change per year ^a
Three fish species (salmon, sheefish or Dolly Varden, and whitefish, estimated edible pounds)												
Ambler	34,783	76,037	66,090	72,285	35,469	94,026	127,889			53,784	64,847	2.4%
Kiana	36,399	40,100	19,102	75,437	38,498	33,703	33,630	47,753		45,644	37,681	0.8%
Kobuk	61,833	35,266	6,787	16,212	14,463	26,281	8,257	22,736		43,506	52,527	2.1%
Noorvik	85,355	89,932	93,062	254,855	120,975	231,574	146,002	163,299	194,364	127,077	98,762	2.3%
Shungnak	84,734	41,415	67,638	84,667	75,323	70,256	43,147	49,125	95,897	80,223	64,569	0.5%
Noatak	38,621	25,632	81,349	50,611	30,279		58,660	19,274	23,809	32,041	67,548	–0.8%
Subtotal ^e				554,066	315,006		417,584			382,275	385,934	–2.8%
Total	341,725	308,381	334,027	554,066	315,006	455,839	417,584	302,187	314,070	382,275	385,934	

a. Percentage change calculated by dividing harvest trend by average harvest.

b. Subtotal calculated only when estimated harvests were available for all communities.

c. Subtotal does not include Noatak, where sheefish estimates were not available for most years.

d. Dolly Varden estimates were not available for all communities until 2003.

e. Subtotal includes estimates of sheefish for Kobuk communities, trout for Noatak, and salmon and whitefish for all communities.

In the 6 study communities from 1994 through 2004, the estimated per capita harvests of salmon were declining by about –6.4% annually (Figure 3-3A). Declining salmon harvests were weakly but significantly associated with time ($r^2=0.383$, $P=0.043$), although the trend was influenced by an outlying high harvest in 1994 and low harvests in 2003 and 2004. Trends in harvests of whitefish (Figure 3-3B), sheefish and Dolly Varden (Figure 3-3C), and all surveyed fish (Figure 3-3D) were not significant. Per capita harvests of all species exhibited considerable interannual variability, as evident in the combined harvest of all 8 species as in the harvests of individual species.

In Noatak, one of the two core study communities, salmon harvests appeared to be declining (Figure 3-4A). The trend was influenced by an outlying high harvest in 1996 and was not significant ($r^2 = 0.225$, $P=0.182$). Although Noatak was surveyed in 1999, harvest estimates were not calculated because fewer than 30 households were contacted. This left only 7 years of harvest estimates for whitefish (Figure 3-4B). The whitefish harvest trend was also influenced by an outlier high harvest in 2004, and not significant. No trend was evident for Dolly Varden ($r^2=0.002$, $P=0.921$), or for all fish in combination, where absolutely no harvest trend was evident ($r^2=0.000$) (Figure 3-4D).

In Shungnak, the other core study community, a weak decline in salmon harvests over time was evident ($r^2=0.338$, $P=0.061$). Outlying whitefish harvests in 2002 and 2003 suggested an increasing trend in whitefish, but in 2004, harvests returned to the levels estimated from 1997 through 2001. Sheefish harvests appeared to be increasing, but the trend was not significant; nor was an apparent increasing trend in all fish combined.

Figure 3-6 summarizes trends in estimated per capita fish harvests (all 8 species combined) in the other 4 study communities. Ambler, Kiana, and Kobuk all had at least one year of missing data. None of the observed trends were statistically significant.

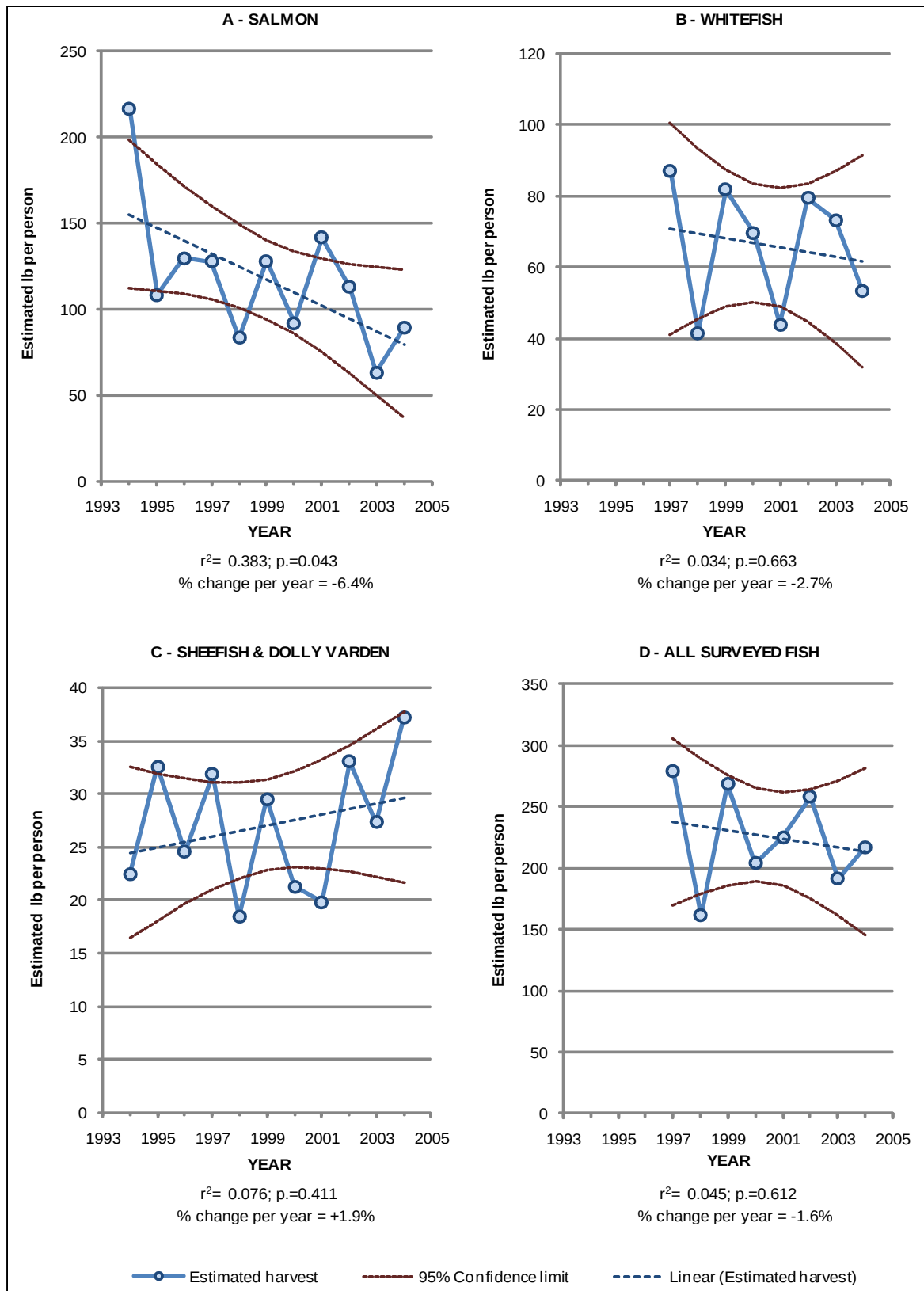


Figure 3-3.—Trends in estimated weight of fish harvests, 6 study communities, 1994–2002.

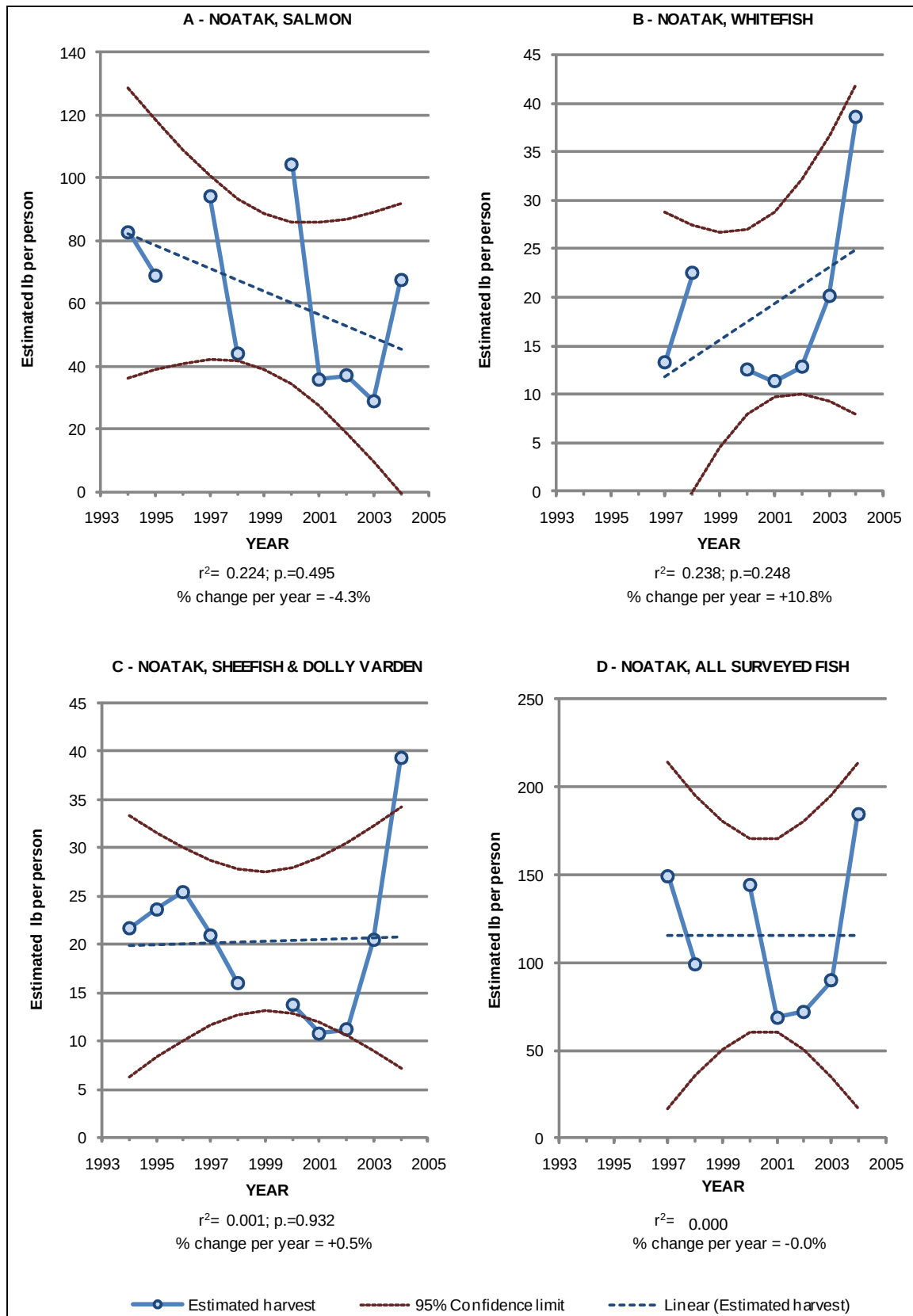


Figure 3-4.—Trends in estimated weight of fish harvested, Noatak, 1994–2004.

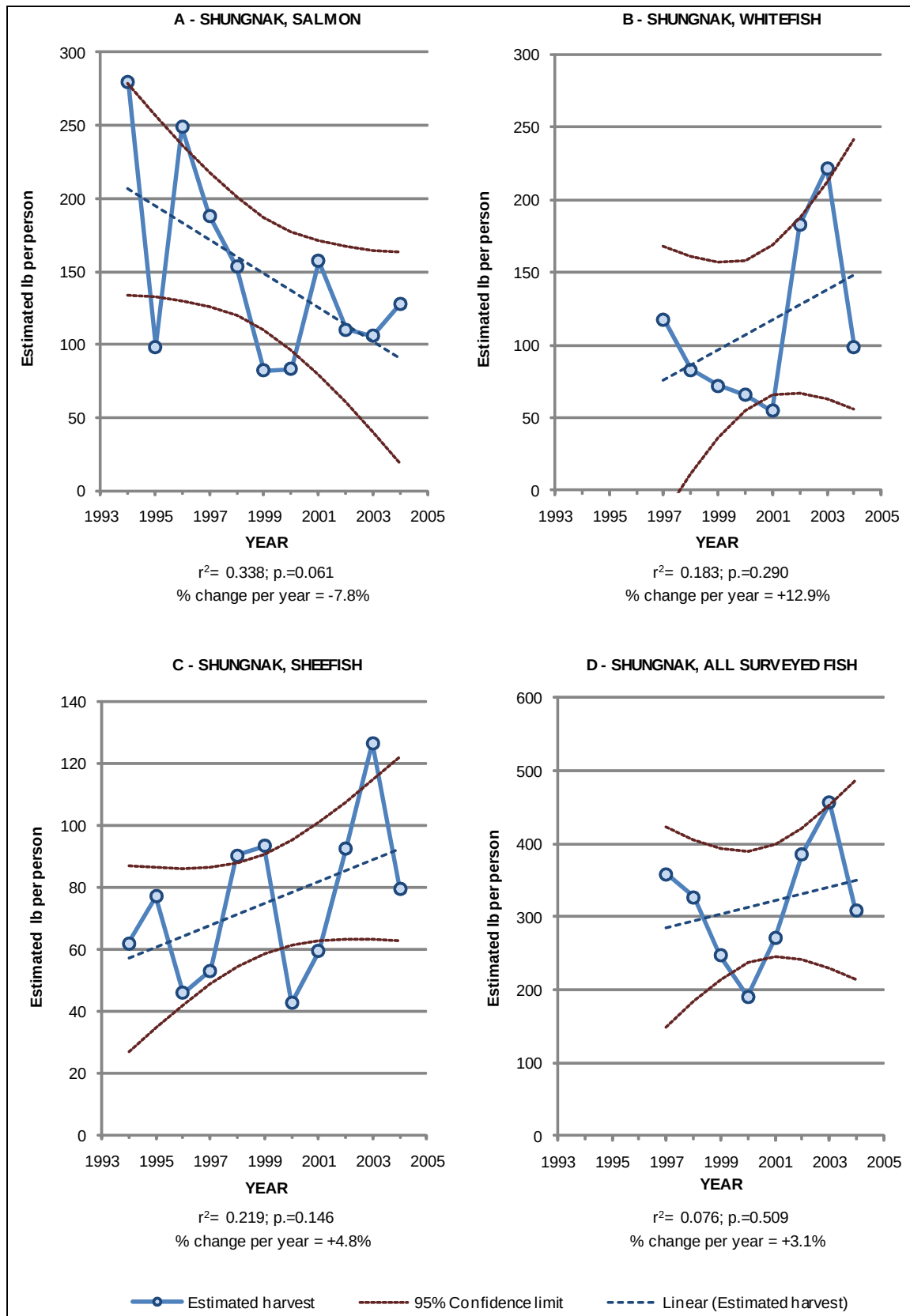


Figure 3-5.—Trends in estimated weight of fish harvested, Shungnak, 1994–2004.

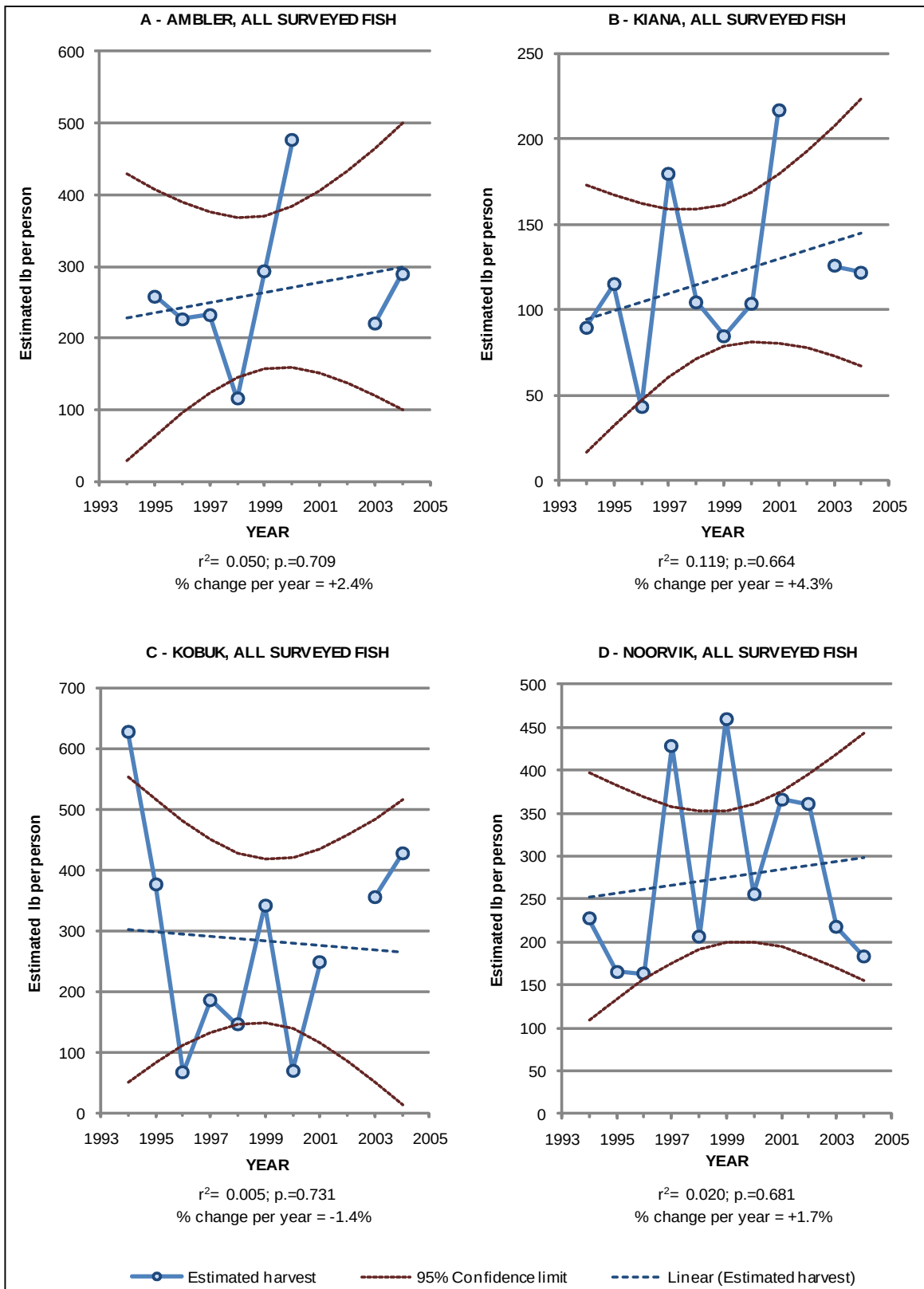


Figure 3-6.—Trends in estimated weight of fish harvested, Ambler, Kiana, Kobuk, and Noorvik, 1994–2004.

Supply and Demand Factors

Two basic factors are likely to influence subsistence harvests: 1) access to abundant fish, and 2) the needs of fishing communities. In other words, both the supply of fish and the demand for fish are expected to influence subsistence harvests. For the study communities, supply did not appear to be a limiting factor. Fish stocks important to Kotzebue District subsistence fisheries were abundant (Scanlon 2009). Chinook, coho, pink, and sockeye salmon appeared to be expanding their range northward in Alaska and into northwestern Canada (Babaluk et al. 2000), thus becoming increasingly available to Kotzebue District fisheries. Declines in chum and Chinook salmon that have affected other areas of western Alaska during the past decade have not been evident in the Kotzebue District. Subsistence fishing was open 365 days a year and subsistence harvests were not limited.

On the supply side, hints of expanding salmon ranges could be found in the estimated per capita subsistence harvests of Chinook, sockeye, coho, and pink salmon, which were increasing by 10% to 32% annually (Figure 3-7). Although per capita amounts were literal handfuls of fish—approximately one-third of one pound of Chinook salmon per person per year, and one-quarter of one pound of sockeye salmon per person per year—all 4 salmon species other than chum salmon displayed increasing trends in estimated per capita subsistence harvests. Presently, only the trend in pink salmon is known to be statistically significant ($r^2 = 0.390$, $P = 0.040$), and only the volume of coho is nutritionally significant (about one serving per year). The catches were not concentrated in one community or watershed, except that Chinook salmon were rarely caught in the Kobuk River upstream of Ambler. In the 6 communities combined, average annual catches ranged from 18 Chinook and 23 sockeye salmon to 233 pink and 690 coho salmon. As already seen in Figure 3-3, overall salmon harvests were declining, driven by declining harvests of chum salmon. From 1994 through 2004, estimated per capita subsistence harvests of chum salmon declined an average of -6.9% annually ($r^2 = 0.402$, $P = 0.036$).

On the demand side, subsistence harvests may be influenced both by numbers of people and dogs, and by people's choices to eat fish or to feed fish to their dogs. The estimated population of the 6 study communities increased from 2,006 in 1994 to 2,126 in 2004, about 0.9% per year (Figure 3-8A). The estimated total weight of fish harvested for human consumption increased 0.6% per year; only slightly less than the rate of increase in the human population (Figure 3-8B). The available data on dog population from the annual salmon surveys indicated that the dog population in the study communities declined about 9% per year. The harvest for dogs also decreased during the study period by about 21% annually. The declines in both the number of dogs and dog food harvests occurred suddenly, beginning in 1996 and ending in 1998. Before 1997, residents reported almost 1,000 dogs, and harvested approximately 100,000 lb of salmon per year for dog food—approximately 19% to 29% percent of the total salmon harvest. After 1997, residents reported having about 350 dogs, and harvested only about 20,000 lb of salmon per year for dog food—approximately 3% to 6% of the total salmon harvest. On average, from 1994 through 2004, 10.5% of the salmon harvested were harvested specifically for dog food.

Changes in Gear Selection

The declining harvests of salmon did not seem to be associated with changes in gear selection (Figure 3-9). At the beginning of the study period, twice as many households reported using set gillnets as reported using rods and reels to catch salmon; by the end of the study period, the numbers of households using the same 2 gear types were approximately the same (Figure 3-9C). Nonetheless, harvests by both types of gear declined at almost exactly the same rates: -7.4% per year for set gillnets, and -7.6% per year for rods and reels (Figure 3-9A and Figure 3-9B). For households that harvested salmon, estimated weights harvested with nets and estimated weights harvested with rods and reels were strongly positively correlated ($r = 0.783$, $P = 0.013$).

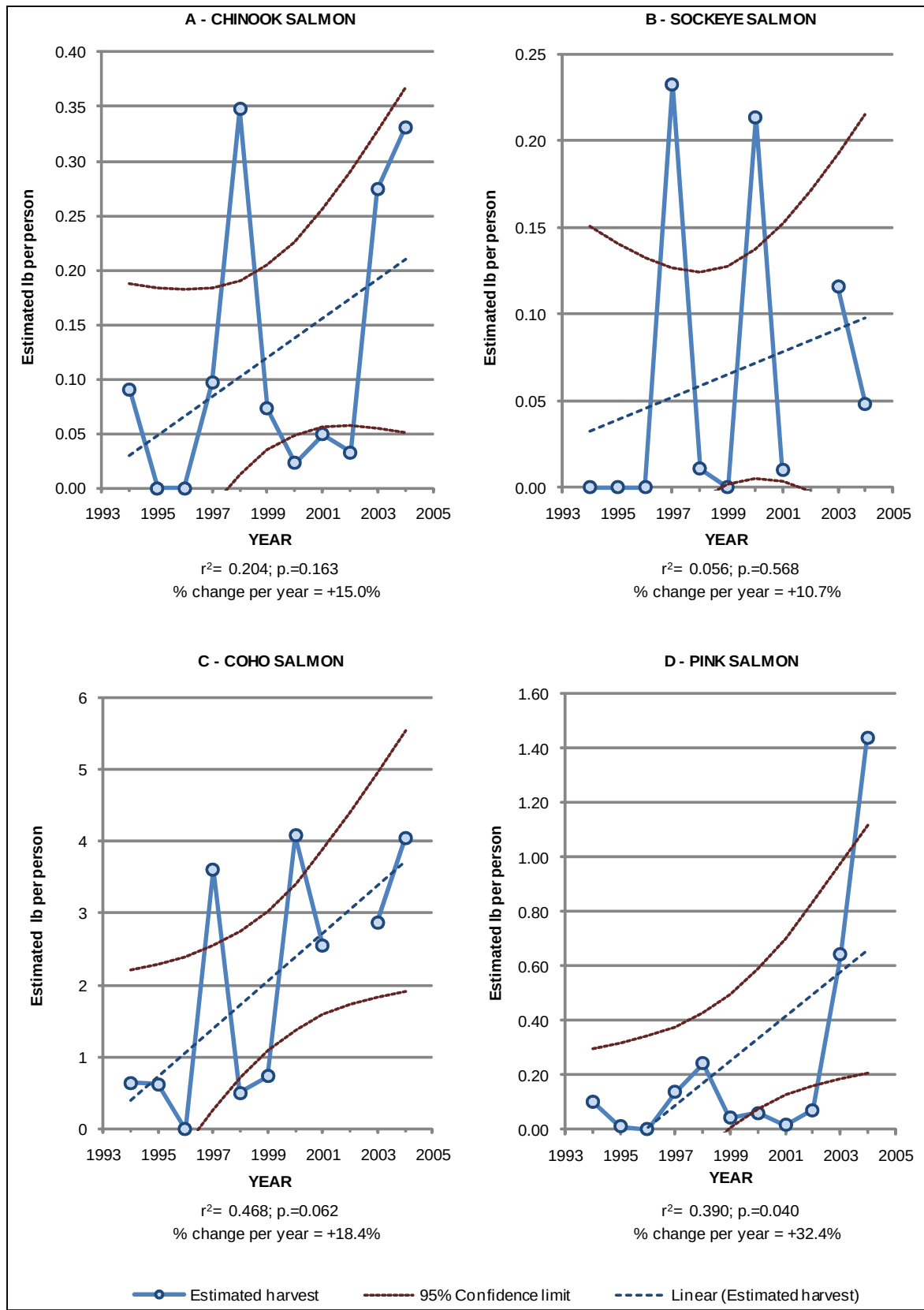


Figure 3-7.—Trends in estimated weight of salmon harvested, 6 study communities, 1994–2004.

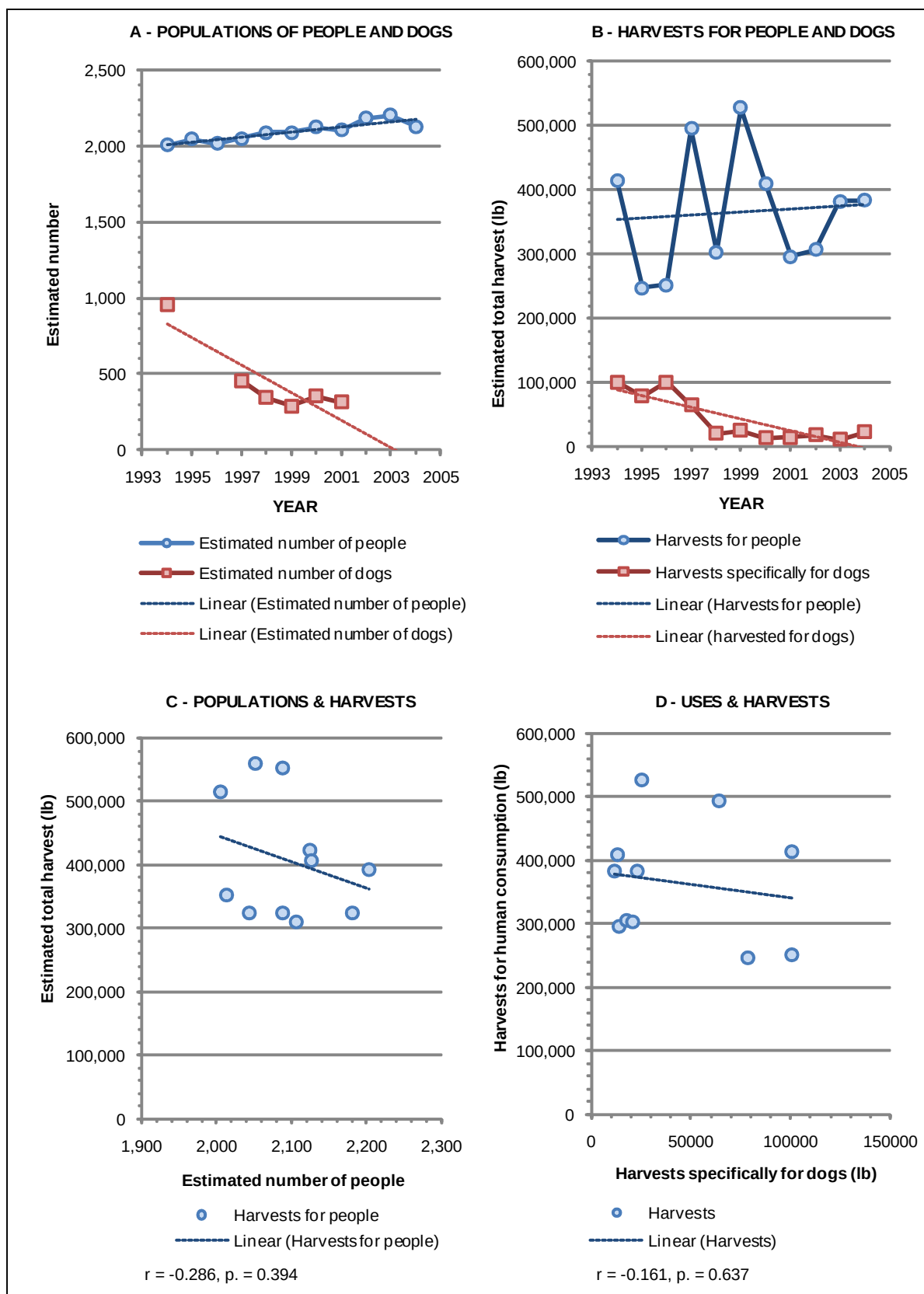


Figure 3-8.—Associations among populations, uses, and harvests, 1994–2004.

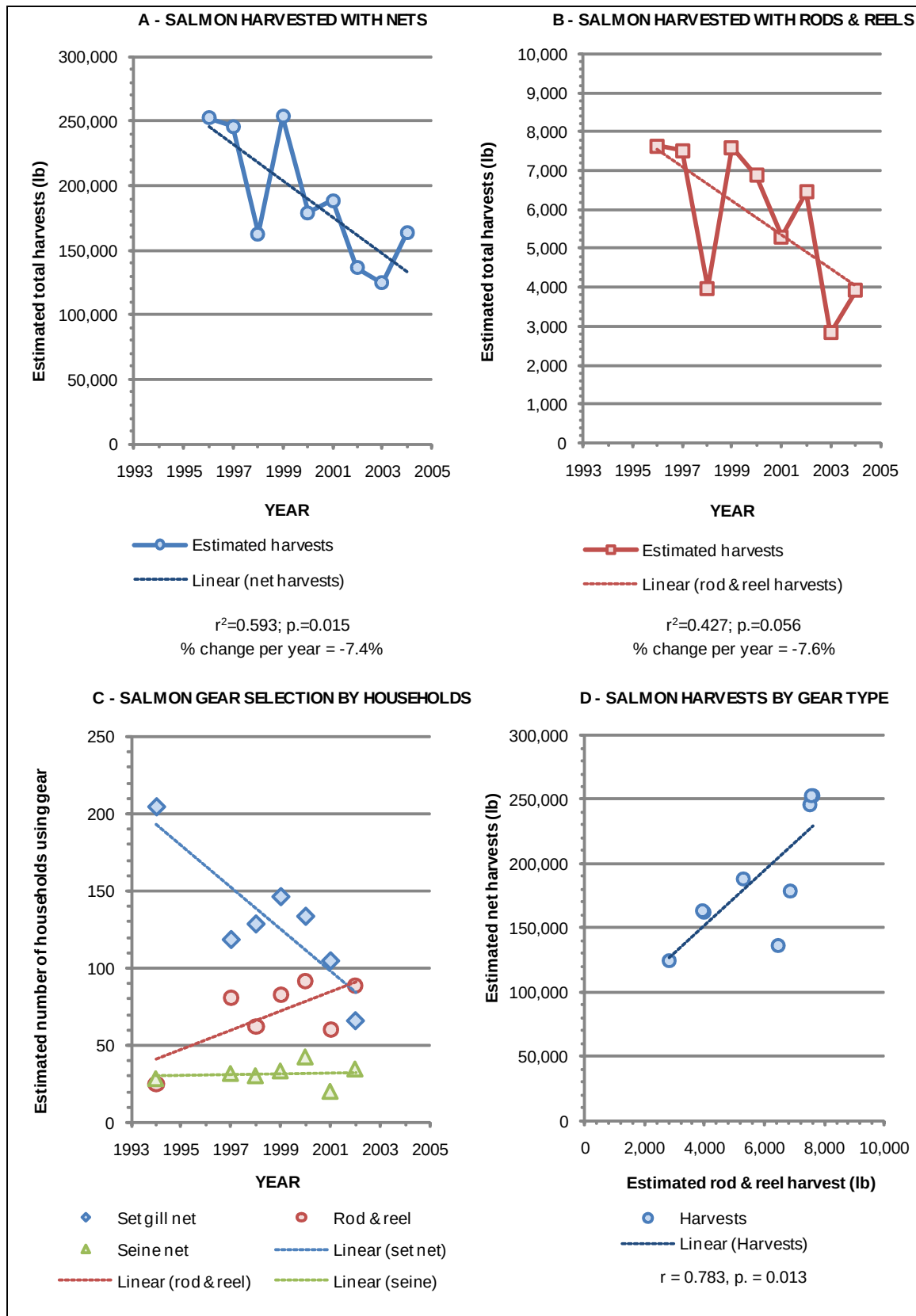


Figure 3-9.—Salmon harvests and gear selection, 1994–2002.

EXPLANATIONS OF CHANGES

In 2008, researchers returned to each of the 6 study communities with a set of individual household and community fishing histories (Appendix B). The idea was to share the histories with selected households during face-to-face interviews, and seek explanations for patterns and trends observed in the data. Researchers interviewed 92 selected households—62 in the core study communities of Noatak and Shungnak and 30 in the other 4 communities.

Researchers showed respondents their households' own fishing histories and then asked a series of questions, beginning with: "Is this how you remember your household's fish harvests?" Of the 92 households, 9 households' recollections (2 in Noorvik, 3 in Noatak, and 4 in Shungnak) were somewhat different from the data presented in the table and chart. The most common difference reported (shared by 3 households) was in whitefish harvests. One household commented that it harvested most of its whitefishes through the ice in winter; thus whitefish harvests were perhaps not fully captured by a fall survey. One household recalled harvesting salmon that were not evident in its data; 2 households were credited with salmon or sheefish that they did not recall harvesting. Several households noted the challenges of assessing shared harvests. One respondent noted that his/her household's harvests appeared to be the result of his/her son fishing with his brother, who lives in another household. Another respondent said that the number of fish on a household harvest report "mainly depends on who has the boat and motor, and [who] helps out other families with the fall seine for salmon and whitefish." Reported differences usually affected only a single survey species.

Although not all respondents agreed with their harvest records, most did. Of the 92 interviewed households, 78 households (85%) said that harvest survey data agreed with their harvest recall (5 households' responses to this question were missing). Given that 85% of the interviewed households agreed with the records of their harvests, researchers concluded that harvest survey data were of sufficient quality to conduct the planned analyses.

Interviewers next asked respondents to name, without prompting, 3 factors that affected their household's fishing from 1994 through 2004, beginning with the most important factor, then continuing to the second, and third most important factors. After they identified each factor, respondents were asked to describe it, categorize its effect on their harvests (up, down, or no change), and identify the year or years in which their household was affected.

Factors could have positive effects, negative effects, both positive and negative effects, or no effects on harvests. A job, for example, might negatively affect fishing by limiting time available to fish; at the same time, it could positively affect fishing by providing money for equipment and supplies. One factor could affect different households in different ways. For example, one Shungnak respondent observed: "When water is high, we don't get as much. When water is very stable, we get more. If [water] rises, fish go up river from village." However, another Shungnak respondent reported the opposite effect: "When weather is bad, we catch more [because fish previously caught spoil in the rain, and must be replaced with additional fish] ..." she said.

Environmental factors, such as "unusual water levels" or "unusual weather," were named most frequently overall, and most frequently as the single most important factor affecting harvests. Environmental factors, accounted for 34% of the reported factors (Figure 3-10). An Ambler respondent said "August has been rainier and rainier; [we] try to start earlier so we can dry [fish] in July." Another noted that the water had been "too low. There is hardly any river to fish: we have to go down, then up. Some fishing spots dried up. Some lakes drained out. Our camp is eroded-out."

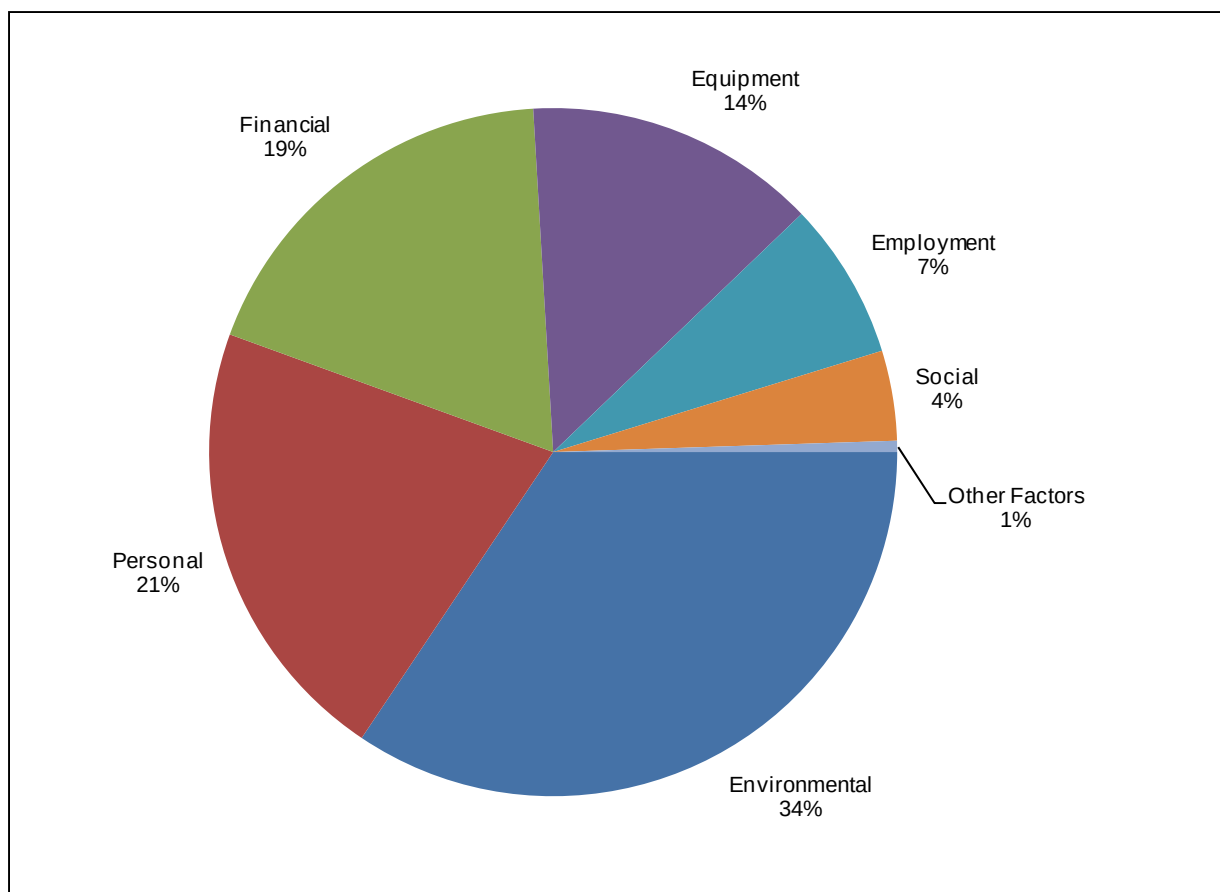


Figure 3-10.—Categories of factors reported as affecting fish harvests.

After environmental factors, personal factors, including health, age, family responsibilities, food preferences (21%), and financial factors (19%) were mentioned most often. By far the most common financial concern was the cost of gasoline, which was mentioned by 29 of 92 households (32%) as one of the three most important factors affecting their harvests. This was exceeded only by the 34 of 92 households (37%) that mentioned water levels, an environmental factor. Various equipment concerns were mentioned by 26 households (28%). Employment concerns were mentioned by only 14 households (15%).

In addition to asking for the 3 most important factors affecting fishing, researchers asked respondents whether their households were affected by each of 19 factors; if so, whether the factor increased harvests, decreased harvests, or had no effect on harvests. Of the 92 interviewed households, 90 responded to these prompted factor questions, and all 90 households reported that their fishing was affected by at least one of the prompted factors. Figure 3-11 summarizes responses to the 19 prompted factors, excluding cases in which the factor had no effect on the household, or no affect on harvests.

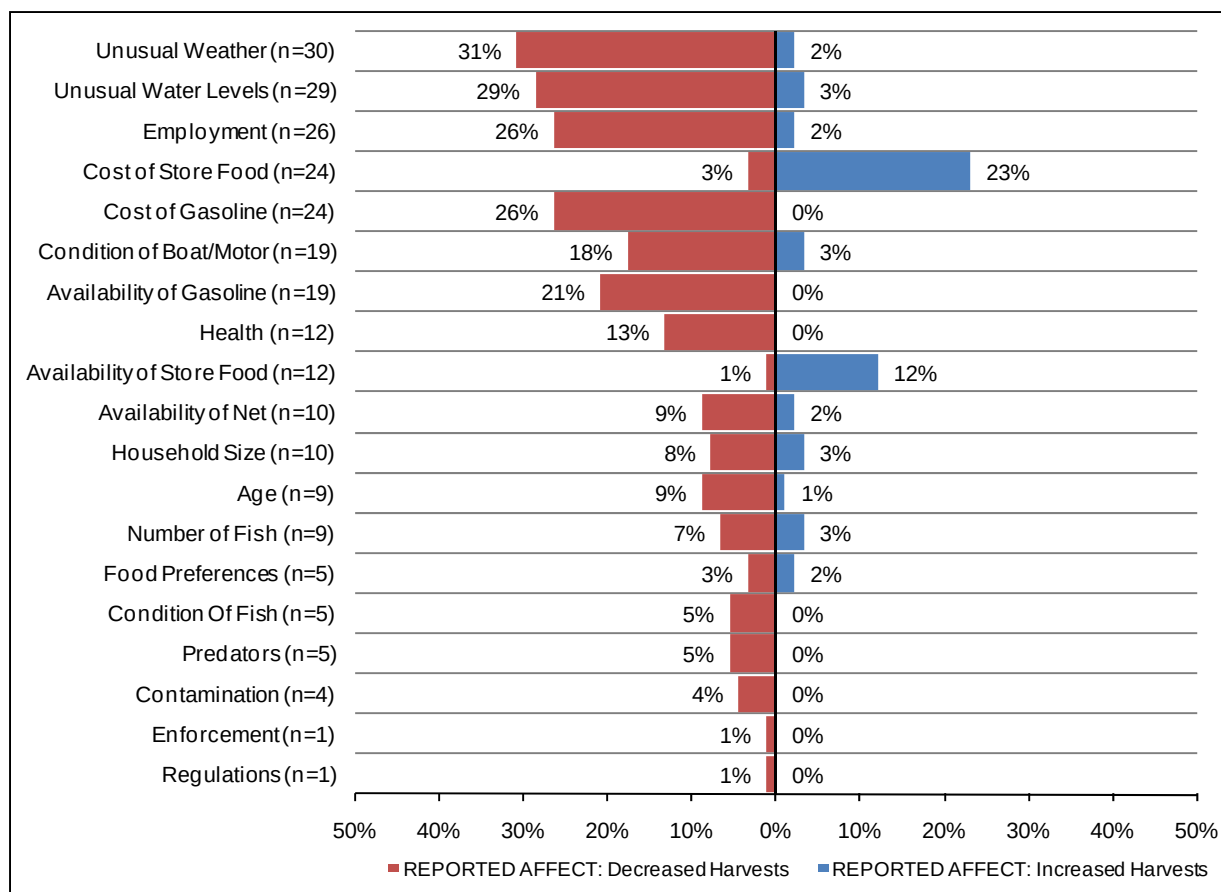


Figure 3-11.—Percentage of households reporting effects on harvests, by factor.

Of the 19 prompted factors, 17 factors (89%) were cited as having primarily negative impacts on harvests. For example, 31% of interviewed households cited unusual weather for decreasing harvests, while only 2% of households cited unusual weather for increasing harvests. The only 2 factors that were cited primarily for increasing harvests were the cost of store foods (by 23% of households) and the availability of store foods (by 12% of households). In other words, some respondents believed that high food costs and limited food availability resulted in increased subsistence harvests.

An important aspect of the analysis was the linking of interview data with harvest survey data. For the interviewed households, researchers combined harvest survey data with factor responses from the interviews. As a group, the 92 interviewed households harvested an average of about 418 lb of salmon and sheefish each year from 1994 through 2004, 88 lb (27%) more than the 330 lb average harvest reported by all surveyed study community households in the same period. This difference was not unexpected because by design the interview samples did not include non-fishing households and households with fewer than 6 years of fishing data. For both groups, there was a non-significant increasing trend of about 6–7 lb per year, or 2% of the annual average (Table 3-2). In other words, harvests by the interviewed households were predictably greater than harvests by all surveyed households, but harvests by both groups were similarly stable.

Table 3-2.—Factors reported as affecting fish harvests.

	Mean annual harvest per household (edible pounds)	Annual harvest trend, 1994–2004 for households citing factor		
		Δ pounds per household	Percentage of mean harvest	Trend category ^a
Factors most frequently reported as harvest negative ("harvests down")				
Unusual weather				
'Harvests down" (n=23)	519 pounds	+ 42 pounds	8%	Up
'No change in harvests" (n=66)	333 pounds	+ 3 pounds	1%	Stable
"Harvests up" (n=2)	1,821 pounds	–144 pounds	–8%	Down
Cost of gasoline				
'Harvests down" (n=22)	429 pounds	+ 2 pounds	1%	Stable
'No change in harvests" (n=69)	417 pounds	+ 7 pounds	2%	Stable
Availability of gasoline				
'Harvests down" (n=19)	431 pounds	+ 23 pounds	5%	Up
'No change in harvests" (n=72)	415 pounds	+ 1 pounds	0%	Stable
Employment				
'Harvests down" (n=9)	475 pounds	+2 pounds	0%	Stable
'No change in harvests" (n=82)	410 pounds	+7 pounds	2%	Stable
Condition of boat or motor				
'Harvests down" (n=8)	474 pounds	+12 pounds	3%	Stable
'No change in harvests" (n=83)	409 pounds	+6 pounds	1%	Stable
Unusual water levels				
'Harvests down" (n=17)	718 pounds	+31 pounds	4%	Stable
'No change in harvests" (n=72)	339 pounds	+7 pounds	2%	Stable
'Harvests up" (n=2)	816 pounds	–37 pounds	–5%	Stable
Factors most frequently reported as harvest positive ("harvests up")				
Cost of store food				
'Harvests down" (n=2)	148 pounds	–26 pounds	–17%	Down
'No change in harvests" (n=68)	386 pounds	+4 pounds	1%	Stable
'Harvests up" (n=21)	556 pounds	+24 pounds	4%	Stable
Availability of store food				
'Harvests down" (n=1)	227 pounds	–42 pounds	–19%	Down
'No change in harvests" (n=54)	441 pounds	–13 pounds	–3%	Stable
'Harvests up" (n=11)	386 pounds	+44 pounds	11%	Up
Interviewed households (N=92)	418 pounds	+7 pounds	2%	Stable
All surveyed households (median N=472)	330 pounds	+6 pounds	2%	Stable

a. Harvests were categorized as “stable” if the annual harvest trend was no more than 5% of the mean annual harvest.

Within the stable overall harvest pattern, it was expected that 1) some households' harvests would be decreasing while other households' harvests would be increasing, 2) interviewed households would be able to identify factors contributing to changes, and 3) factors contributing to changing patterns and trends in harvests could be identified. Researchers were unable to find such associations.

Table 3-2 summarizes 8 factors reported by at least 10% of the interviewed households. These included 6 factors reported as having negative effects on harvests, and 2 factors reported as having positive effects on harvests. For each group of households reporting an effect from a particular factor, researchers compared the mean annual harvests (in edible weights of salmon and sheefish), the annual harvest trend, in pounds and as a percentage of the average annual harvest, and categorized the trend as increasing, stable, or decreasing.

The most commonly reported factor having a negative effect on harvests was unusual weather. Oddly, the 23 households reporting that harvests decreased as a result of unusual weather actually reported modestly increasing harvests during the study period, about 42 lb (8%) more per year. The 66 households reporting no effect or no change had stable harvests during the study period. Indeed, every single group of households that reported that a factor decreased their harvests also reported stable or increasing harvests during the study period. Households reporting a negative effect had higher harvests than other interviewed households, sometimes much higher (such as for "unusual water levels"). The largest negative harvest trends were for factors most frequently identified as positive, such as the cost and availability of store foods. These negative trends were not statistically significant because they were reported by only 2 households, and 1 household, respectively.

4 DISCUSSION AND RECOMMENDATIONS

Salmon—flayed filets of bright red flesh hanging from homemade wooden racks, slowly drying and smoking in cool northern air—are an iconic image of subsistence in Alaska. Often overlooked, though, was the important role other fish played in the subsistence economy. In these study communities—as in most interior rural Alaska communities—fish were central to the subsistence economy. While salmon still occupied a central position in the subsistence economy, analyses of these communities' harvests indicated a diminishing role for salmon and an expanding role for other species.

The data described a stable subsistence fishery, not without interannual variation, and not without shifts in species selections, but stable in the sense that residents continued to harvest almost exactly the same amount of fish per person over a decade's time. With modestly increasing human populations, total fish harvests increased at similarly modest rates.

The strongest trend identified in the analysis was the declining estimated per capita harvest of chum salmon, -6.9% annually ($r^2=0.402$, $P=0.036$). The decline was evident for harvests taken with both subsistence nets and rods and reels. The decline in estimated salmon harvests was not because households switched from more efficient nets to less efficient rods and reels, though they clearly did do that. Residents of the study communities may be increasing their use of rods and reels to catch sheefish and Dolly Varden, and incidentally harvesting chum salmon. Sheefish and Dolly Varden readily take a lure, while spawning chum salmon are less likely to do so. That would explain both the increases in sheefish harvests observed among the Kobuk communities, and the increased use of rod and reel for salmon fishing. Sheefish and chum salmon migrate up the Kobuk River at the same time to spawn.

The decreasing dog population and the decreasing amount of salmon fed to dogs coincided with the departure of an Iditarod dog racing family who relied substantially on salmon for dog food, from a study community. This would not account the loss of hundreds of dogs, but interest in dog mushing in the community may have declined somewhat with their departure. Confidential names are no longer associated with the data, so this could not be confirmed.

The inconsistencies among reported factors and reported harvests summarized in Table 3-2 were unexpected. Even with charts and tables showing their own household's stable harvest history on the table before them, households would report declining harvests and name a factor or factors in the perceived decline.

Previous research has found that age of household heads is one of the best predictors of subsistence harvest levels (Wolfe 1987; Wolfe et al. In prep [2009]), but that did not appear to be the case with respect to respondents in this study. Respondents ranked age lower (12 of 19 prompted factors) and mentioned age much less frequently than most of the other factors, including weather, water levels, employment, gasoline costs, and equipment. One possible explanation is that although the effects of age on harvest levels are real and thus observable by Wolfe and others, most respondents have already factored age into their harvest expectations.

Factors notably absent from the interviews are those related to management. Regulations and enforcement were among the 19 prompted factors, but were identified as a factor by only 1 household each. This result was not unexpected in an area without subsistence fishing limits, fishing periods, or closed waters, and only standard statewide restrictions on gear, methods, and means. The one regulatory complaint was about the state's fishing license requirements for rod and reel gear. The state considers rod and reel fishing to be sport fishing, and therefore requires a sport fishing license. Under federal regulations, rod and reel gear is legal subsistence gear, and therefore does not require a license on federal lands and waters for federally qualified subsistence users.

RECOMMENDATIONS

Household level subsistence harvest surveys remain a valuable tool for fisheries management and for understanding the role of fish in local economies. Given that respondents prefer shorter surveys and researchers prefer more data, survey design is a key issue. The original surveys used to gather data for this project were simple and short and—especially important—consistent from year to year. They were similar to annual salmon surveys used in the Kuskokwim, Yukon, and Norton Sound–Port Clarence areas, but unlike most salmon surveys included additional questions about nonsalmon species.

The data gaps in Table 3-1 illustrate how challenging it can be to compile comparable information across groups of communities, years, and species even with a robust harvest monitoring program. Funding was always an issue, as was project staffing. Data were most complete in the final 2 years, 2003 and 2004, after which the project was cancelled. There is now a proposal pending to replicate the effort, at least on a short-term basis.

Aside from administrative continuity, there are several simple ways in which surveys might be improved.

- *Annual fish surveys should include key nonsalmon species.* Most annual fish surveys include only salmon. Adding 3 additional species to the 5 salmon species on the Northwest Alaska survey form raised the proportion of the documented fish harvest from about 40% (5 salmon species) to an estimated 97% (8 fish species) of the total fish harvest, a huge gain in information at very little cost to respondents or researchers.
- *Household surveys should collect harvest by gear type.* These surveys asked households how many salmon were caught by rod and reel, but did not collect harvests by other gear type for salmon or by any specific gear type for other species. That closed the door to some useful analyses, especially given proposals to the Alaska Board of Fisheries' decision in 2009 to recognize rod and reel as legal subsistence gear in the Kotzebue District (which were not adopted). Annual fish surveys usually do not collect harvest by gear type; comprehensive surveys usually do. Harvest by gear type could have been an important aspect of these analyses, but was limited by the available data.
- *Household surveys should collect both household and dog populations.* Historically, dogs have been major consumers of subsistence-caught fish in Alaska. Most salmon surveys ask for the number of

people living in the household, but do not always ask for the number of dogs. The dog question was included in these surveys in most years, but inexplicably, responses were missing from the data files for 1995 and 1996. Then the dog population question was dropped altogether in 2003 and 2004. Consequently, analyses of harvests for dogs also were limited by available data.

- *Household surveys should collect the age of the household head.* Wolfe (2009) and others have shown the age of the household head is an important factor in household harvests. It is easy information to obtain, but rarely included in annual surveys.
- *Household surveys should prompt for at least one general factor that affected fishing.* The original Northwest Alaska surveys asked “How was subsistence chum salmon fishing for your household this year?” For households that responded “poor,” a follow up question asked “Why?” These answers were useful, but obviously could not be used to explain changes in harvests of any species other than chum salmon. The 3-important-factors section of the interview protocol used in this project (Appendix B) provides an alternative approach that requires minimum respondent effort. Instead of asking a leading question about a single species, the question could be: “What was the single most important thing that affected your household’s fishing this year?” It could be followed—as it was in the interview protocol—by asking: “Did anything else affect your fishing?” Such questions would widen the response field to include employment status, age, health, economic conditions such as fuel cost, and many other factors. In times of declining harvests, managers, committees, councils, and boards always seek explanations. Declining harvests are not an explanation; they are merely an indication of a change. That seems obvious, but often is not reflected in the design of annual harvest monitoring surveys.
- *Comprehensive surveys can substitute for annual surveys.* When a comprehensive survey is scheduled for a community normally included in an annual post-season salmon survey project, it is not necessary to conduct both surveys. In this project, comparisons of results from 4 comprehensive surveys with results from annual post-season salmon surveys in the same communities suggested that the 2 methods provided comparable results. This assumes that the design of survey instruments, field methods, and analytical methods are consistent. Magdanz et al. (2010) discusses a program for coordinating research to reduce respondent fatigue and to improve efficiency in research.
- *Consideration should be given to asking a “catch-all” harvest question.* For example: “Did your household harvest any other kind of fish?” Species abundance and distributions in Alaska are changing, sometimes dramatically. Harvest monitoring surveys could anticipate these changes. A review of responses to comprehensive surveys—which include “catch-all” questions—would indicate how much respondent burden would be involved in answering such a question.
- *Consideration should be give to documenting fishing effort.* Harvest levels alone are not complete indicators of fishing conditions. Having to fish several weeks instead of a few days to catch a desired amount of fish is a substantial change. The authors do not have a specific approach to recommend, but encourage exploration in this area.

As agencies and non-profit organizations have gained more experience with harvest monitoring surveys, some of these recommendations are already being implemented. Cross-regional and inter-agency comparisons of methods and results from these efforts would be beneficial.

A big part of this project was to clean and correct a relatively modest data set, a task that seemed never-ending. Researchers spent more time reviewing, cleaning, organizing, and merging data than in actual analysis. The issues included changes over time in data storage software and formats, inconsistent data entry practices, and missing variable and value labels. Many of these issues were consequences of constantly evolving data management environments, and were not unique to this data set. Good data management begins long before the first survey is administered. It rests on well designed instruments, on properly trained data collection teams, on adequate field supervision, and on quality control that begins

with survey number one. A long-term harvest monitoring program requires robust data management, in which legacy data are given the same attention as the most current information.

ACKNOWLEDGEMENTS

Many people in the 6 study communities worked more than a decade to gather the original data used in this project. These analyses would not have been possible without their contributions. The average sample included 84% of the occupied households, 390 households per year. Achieving such consistently large samples was not easy to do, and was a testament to the dedication of community researchers and the fisheries technicians who worked with them. The analyses also would not have been possible without years of commitment to the annual salmon survey project by Susan Georgette, then a subsistence resource specialist for Division of Subsistence, as well as the commitments of former Division of Subsistence data analysts David Caylor, Charles Utermohle, and Robert Walker. Many former and current Commercial Fisheries Division area biologists including Charles Lean, Fred Bue, Tracy Lingnau, Wes Jones, and Jim Menard supported the survey project, and provided funds from 1994 through 2003. Ken Adkisson of the National Park Service provided funding for the final year of surveys in 2004.

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APPENDIX A: TABLES

Table A-1.—Samples for original annual surveys and for this project.

	Original Harvest Survey Project												This Project	
	Annual Sampling Results											1994–2004		2008
	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	Mean	Median	
CORE STUDY COMMUNITIES														
Shungnak														
Eligible Households ^a	55	53	56	57	56	51	46	46	54	50	56	53	54	33
Contacted	52	44	51	47	50	28	34	39	51	33	47	43	47	25
Sample Fraction	95%	83%	91%	82%	89%	55%	74%	85%	94%	66%	84%	82 %	84 %	76 %
Noatak														
Eligible Households ^a	84	92	88	84	97	91	102	96	101	104	105	95	96	68
Contacted	68	76	74	75	90	14	61	67	90	103	103	75	75	37
Sample Fraction	81%	83%	84%	89%	93%	15%	60%	70%	89%	99%	98%	79 %	84 %	54 %
Core Community Subtotal														
Eligible Households ^a	139	145	144	141	153	142	148	142	155	154	161	148	145	101
Contacted	120	120	125	122	140	42	95	106	141	136	150	118	122	62
Sample Fraction ⁴	86%	83%	87%	87%	92%	30%	64%	75%	91%	88%	93%	80 %	84 %	61 %
OTHER STUDY COMMUNITIES														
Ambler ^b														
Eligible Households ^a	74	78	82	83	80	71	70	69	69	67	63	73	71	28
Contacted	29	68	80	69	73	21	34	0	0	62	60	45	60	9
Sample Fraction	39%	87%	98%	83%	91%	30%	49%	0%	0%	93%	95%	62 %	83 %	32 %
Kiana ^c														
Eligible Households ^a	104	101	103	108	102	91	88	87	91	95	87	96	95	42
Contacted	59	76	88	86	88	67	51	66	0	90	77	68	76	9
Sample Fraction	57%	75%	85%	80%	86%	74%	58%	76%	0%	95%	89%	71 %	76 %	21 %
Kobuk ^c														
Eligible Households ^a	24	27	24	26	25	23	30	26	30	34	28	27	26	11
Contacted	22	23	22	22	25	13	15	24	0	23	28	20	22	2
Sample Fraction	92%	85%	92%	85%	100%	57%	50%	92%	0%	68%	100%	73 %	85 %	18 %
Noorvik														
Eligible Households ^a	122	126	124	124	129	118	112	108	115	138	133	123	124	61
Contacted	64	103	111	114	109	48	42	56	101	135	125	92	103	10
Sample Fraction	52%	82%	90%	92%	84%	41%	38%	52%	88%	98%	94%	75 %	84 %	16 %
Other Community Subtotal														
Eligible Households ^a	324	332	333	341	336	303	300	290	305	334	311	319	324	142
Contacted	174	270	301	291	295	149	142	146	101	310	290	224	270	30
Sample Fraction ^d	54%	81%	90%	85%	88%	49%	47%	50%	33%	93%	93%	70 %	84 %	21 %
ALL COMMUNITIES														
Eligible Households ^a	463	477	477	482	489	445	448	432	460	488	472	467	472	243
Contacted	294	390	426	413	435	191	237	252	242	446	440	342	390	92
Sample Fraction ^d	63%	82%	89%	86%	89%	43%	53%	58%	53%	91%	93%	73 %	84 %	38 %

a. For the original survey, an "eligible" household was any occupied household in the community. For this project, an "eligible" household was a household that was: (a) surveyed in at least 6 of the 11 survey years, (b) actually harvested fish in at least 1 year, (c) had a consistent household identifier, and (d) was present in the community in 2008.

b. Ambler was not surveyed in 2001 and 2002. Number of eligible households is an average of 2000 and 2003.

c. Kiana and Kobuk were not surveyed in 2002. Number of eligible households is an average of 2001 and 2003.

d. Summary mean and median values are based on results in each individual community each year, not on summary values.

Table A-2.–Factors used to convert individual fish to edible pounds of fish.

	Estimated Pounds		Estimated Number of Individual Fish Per... ^a					
	Per Individual Fish		Shopping (AC) Bag	5-Gallon Bucket	Garbage Sack	Gunny Sack	Metal Washtub	Garbage Can
	Round	Edible						
Salmon^b								
Chinook Salmon	17.7 lbs.	12.4 lbs.	1	2	3	6	7	11
Chum Salmon	8.5 lbs.	6.0 lbs.	2	4	7	12	15	24
Coho Salmon	7.4 lbs.	5.2 lbs.	2	4	8	14	17	27
Pink Salmon	3.0 lbs.	2.1 lbs.	5	10	20	33	42	67
Sockeye Salmon	7.2 lbs.	5.0 lbs.	2	4	8	14	17	28
Unknown Salmon ^c	8.5 lbs.	6.0 lbs.	2	4	7	12	15	24
Whitefish								
Humpback Whitefish	3.0 lbs.	2.1 lbs.	5	10	20	33	42	67
Round Whitefish	1.0 lbs.	0.7 lbs.	15	30	60	100	125	200
Broad Whitefish	4.5 lbs.	3.2 lbs.	3	7	13	22	28	44
Mixed Whitefish ^d	2.9 lbs.	2.0 lbs.	5	10	21	34	43	69
Unknown Whitefish	2.8 lbs.	1.4 lbs.	5	11	21	35	44	71
Bering Cisco	2.0 lbs.	1.4 lbs.	8	15	30	50	63	100
Least Cisco	0.8 lbs.	0.6 lbs.	19	38	75	125	156	250
Other Fish								
Sheefish ^e	15.91 lbs.	11.14 lbs.	1	2	4	6	8	13
Dolly Varden (Trout)	4.70 lbs.	3.30 lbs.	3	6	13	21	27	43
Saffron Cod (Tomcod) ^f	0.30 lbs.	0.21 lbs.	33	67	150	250	333	500
Arctic Cod (Blue Cod) ^f	0.16 lbs.	0.11 lbs.	64	127	286	477	636	955
Arctic Flounder	1.50 lbs.	1.10 lbs.	10	20	40	67	83	133
Burbot	6.00 lbs.	4.20 lbs.	3	5	10	17	21	33
Northern Pike	4.70 lbs.	3.30 lbs.	3	6	13	21	27	43
Arctic Grayling	1.25 lbs.	0.90 lbs.	12	24	48	80	100	160
Rainbow Smelt	0.20 lbs.	0.14 lbs.	75	150	300	500	625	1000
Pacific Herring	0.26 lbs.	0.18 lbs.	58	115	231	385	481	769
Container Useful Capacities			~2 gal	~4 gal	~10 gal	~15 gal	~15 gal	~25 gal
Container Loaded Weights^g								
Wet Fish	-		15 lb	30 lb	60 lb	100 lb	125 lb	200 lb
Frozen Fish	-		10 lb	20 lb	45 lb	75 lb	100 lb	150 lb

a. Estimated number of individual fish = loaded container weight for wet fish / estimated round weight of individual fish.

b. Salmon weights are based on average weights reported in Kotzebue District commercial fisheries.

c. Unknown salmon are assumed to be mostly chum salmon, the predominant species in Northwest Alaska.

d. Mixed whitefish conversion assumes 95% are humpback whitefish and 5% are round whitefish.

e. Sheefish conversion based on average weights of sheefish caught in the Kobuk River (Alt 1988) and (Taube 1976, 1977, 1978).

f. Estimated number of saffron cod or Arctic cod = loaded container weight frozen fish / estimated round weight of individual fish.

g. Container loaded weights from Georgette and Loon 1993.

Table A-3.—Community samples and reported harvests in original project reports.

	Year	Number of households surveyed	Reported number of fish harvested						Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish		
Ambler	1994	29	0	6,444	5	0	0	819		
	1995	68	1	7,777	0	1	5	1,791		
	1996	80	1	8,873	6	64	2	1,188		
	1997	69	0	2,337	1	12	4	1,322		12,916
	1998	73	0	2,208	0	2	2	859		3,017
	1999	21	0	590	100	0	0	559		8,170
	2000	34	0	2,620	0	0	0	810		16,193
	2001									
	2002									
	2003	62	9	1,641	45	61	1	703	233	13,207
Kiana	2004	60	32	3,338	24	6	3	2,319	102	5,635
	1994	59	0	1,891	0	10	0	399		
	1995	76	0	4,583	0	5	0	1,131		
	1996	88	5	3,238	10	0	0	842		
	1997	86	0	1,887	116	5	0	1,062		18,171
	1998	88	27	3,196	16	6	0	511		4,864
	1999	67	3	1,490	20	4	0	452		3,535
	2000	51	0	567	65	0	45	412		5,261
	2001	67	0	2,749	0	0	0	987		5,342
	2002									
Kobuk	2003	90	14	1,864	65	77	0	877	92	10,421
	2004	77	0	2,326	54	40	0	1,050	97	5,344
	1994	22	3	5,722	0	0	0	730		
	1995	23	1	2,759	0	0	0	751		
	1996	22	0	1,622	1	0	0	408		
	1997	22	0	629	0	0	0	807		1,380
	1998	25	0	1,031	0	0	0	397		1,115
	1999	13	0	1,438	0	0	0	472		670
	2000	15	0	318	0	0	0	140		805
	2001	24	0	2,640	0	1	1	30		0
Noatak	2002									
	2003	23	1	969	0	12	0	530	0	6,217
	2004	28	3	3,087	6	1	0	1,218	20	5,302
	1994 ^a	68	3	4,872	150	1	0	79	3,747	2,027
	1995	76	0	5,703	100	0	0		4,914	
	1996	74	0	8,996	0	0	1		5,031	
	1997	75	4	4,930	8	0	0		4,372	2,183
	1998	90	5	2,496	0	6	2		3,666	4,048
	1999	14	0	1,616	0	10	0		0	1,375
	2000	61	0	4,456	53	2	1		2,009	1,618
	2001	68	0	1,687	84	0	0		1,933	1,595
	2002	90	0	2,626	10	0	0		2,892	2,610
	2003	103	1	2,150	28	17	10	2	5,602	4,343
	2004	103	10	3,997	518	756	12	70	10,757	8,502

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Table A-1.–Page 2 of 2.

	Year	Number of households surveyed	Reported number of fish harvested						Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish		
Noorvik	1994	64	2	8,517	0	0	0	528		
	1995	103	7	13,494	41	30	1	3,052		
	1996	111	31	12,859	243	567	0	3,129		
	1997	114	8	13,284	628	72	74	4,662		28,625
	1998	109	19	8,685	124	198	0	1,401		14,665
	1999	48	2	9,027	0	4	0	1,770		14,927
	2000	42	2	4,375	725	30	0	1,365		6,520
	2001	56	4	10,228	406	6	0	1,030		9,627
	2002	101	3	12,542	40	7	8	3,882		20,378
	2003	135	13	7,690	862	367	1	3,351	275	15,604
	2004	125	8	5,822	881	428	3	2,764	420	12,801
Shungnak	1994	52	0	7,982	0	1	0	1,250		
	1995	44	0	4,876	0	0	0	1,361		
	1996	51	0	7,806	0	0	0	836		
	1997	47	2	4,831	0	0	0	961		11,558
	1998	50	0	4,222	38	0	0	1,650		8,241
	1999	28	0	1,719	0	0	0	1,055		4,427
	2000	34	0	2,208	1	0	0	632		5,267
	2001	42	0	4,055	0	0	0	885		4,425
	2002 ^a	51	0	3,598	1	33	1	1,908	90	20,424
	2003	33	0	2,103	2	9	30	1,409	66	13,417
	2004	47	0	3,620	7	7	0	1,476	102	9,913

a. Data collected during comprehensive community surveys.

■ = not surveyed or not included on survey

Table A-4.–Community samples and reported harvests in this project's data set.

	Year	Number of households surveyed	Reported number of fish harvested						Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish		
Ambler	1994	29	0	6,444	5	0	0	819		
	1995	69	1	7,778	0	1	5	1,791		
	1996	81	1	8,873	6	64	2	1,188		
	1997	69	0	2,337	1	12	4	1,322		12,916
	1998	73	0	2,208	0	2	2	859		3,017
	1999	21	0	590	100	0	0	559		8,170
	2000	34	0	2,620	0	0	0	810		16,193
	2001									
	2002									
	2003	62	9	1,641	45	61	1	703	233	13,207
Kiana	2004	60	32	3,338	24	6	3	2,319	102	5,635
	1994	59	0	1,891	0	10	0	399		
	1995	80	0	4,585	0	5	0	1,141		
	1996	88	5	3,238	10	0	0	842		
	1997	86	0	1,887	116	5	0	1,062		18,171
	1998	88	27	3,196	16	6	0	511		4,864
	1999	67	3	1,490	20	4	0	452		3,535
	2000	51	0	567	65	0	45	412		5,261
	2001	67	0	2,749	0	0	0	987		5,342
	2002									
Kobuk	2003	90	14	1,864	65	77	0	877	92	10,421
	2004	76	0	2,326	54	40	0	1,050	97	5,344
	1994	22	3	5,722	0	0	0	730		
	1995	23	1	2,759	0	0	0	751		
	1996	22	0	1,622	1	0	0	408		
	1997	22	0	629	0	0	0	807		1,380
	1998	25	0	1,031	0	0	0	397		1,115
	1999	13	0	1,438	0	0	0	472		670
	2000	15	0	318	0	0	0	140		805
	2001	24	0	2,640	0	1	1	30		0
Noatak	2002									
	2003	23	1	969	0	12	0	530	0	6,217
	2004	28	3	3,087	6	1	0	1,218	20	5,302
	1994 ^a	68	4	4,820	150	0	0	79	3,754	2,343
	1995	77	0	5,704	100	0	0		5,014	
	1996	74	0	8,996	0	0	1		5,031	
	1997	75	4	4,930	8	0	0		4,372	2,183
	1998	90	5	2,496	0	6	2		3,666	4,048
	1999	14	0	1,616	0	10	0	100	0	1,375
	2000	61	0	4,465	53	2	1	75	2,009	1,618
	2001	68	0	1,687	84	0	0		1,933	1,595
	2002	90	0	2,626	10	0	0		2,892	2,610
	2003	103	1	2,150	28	17	10	2	5,602	4,343
	2004	103	10	3,997	518	756	12	70	10,757	8,502

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Table A-4.–Page 2 of 2.

	Year	Number of households surveyed	Reported number of fish harvested							Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish			
Noorvik	1994	64	2	8,517	0	0	0	528			
	1995	104	7	13,494	41	30	1	3,052			
	1996	111	31	12,859	243	567	0	3,129			
	1997	115	8	13,284	628	72	74	4,662		28,625	
	1998	109	19	8,685	124	198	0	1,401		14,665	
	1999	48	2	9,027	0	4	0	1,770		14,927	
	2000	42	2	4,375	725	30	0	1,365		6,520	
	2001	56	4	10,228	406	6	0	1,030		9,627	
	2002	101	3	12,542	40	7	8	3,882		20,378	
	2003	135	13	7,690	862	367	1	3,351	275	15,604	
	2004	125	8	5,822	881	428	3	2,764	420	12,801	
Shungnak	1994	52	0	7,982	0	1	0	1,250			
	1995	45	0	4,877	0	0	0	1,371			
	1996	51	0	7,806	0	0	0	836			
	1997	47	2	4,831	0	0	0	961		11,558	
	1998	50	0	4,222	38	0	0	1,650		8,241	
	1999	28	0	1,719	0	0	0	1,055		4,427	
	2000	34	0	2,208	1	0	0	632		5,267	
	2001	42	0	4,055	0	0	0	885		4,425	
	2002 ^a	51	0	3,598	1	33	0	1,908	83	20,424	
	2003	33	0	2,103	2	9	30	1,409	66	13,417	
	2004	47	0	3,620	7	7	0	1,476	147	9,913	

a. Data collected during comprehensive community surveys.

■ = not surveyed or not included on survey

Table A-5.–Summary of review of samples and reported harvests.

		Differences between original reported harvests and this project's data set ^a									
	Year	Households Surveyed	Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish	Dolly Varden	Whitefish	
Ambler	1994	-	-	-	-	-	-	-			
	1995	1	-	1	-	-	-	-			
	1996	1	-	-	-	-	-	-			
	1997	-	-	-	-	-	-	-		-	
	1998	-	-	-	-	-	-	-		-	
	1999	-	-	-	-	-	-	-		-	
	2000	-	-	-	-	-	-	-		-	
	2001										
	2002										
	2003	-	-	-	-	-	-	-		-	-
	2004	-	-	-	-	-	-	-		-	-
Kiana	1994	-	-	-	-	-	-	-			
	1995	4	-	2	-	-	-	10			
	1996	-	-	-	-	-	-	-			
	1997	-	-	-	-	-	-	-		-	
	1998	-	-	-	-	-	-	-		-	
	1999	-	-	-	-	-	-	-		-	
	2000	-	-	-	-	-	-	-		-	
	2001	-	-	-	-	-	-	-		-	
	2002										
	2003	-	-	-	-	-	-	-		-	-
	2004	(1)	-	-	-	-	-	-		-	-
Kobuk	1994	-	-	-	-	-	-	-			
	1995	-	-	-	-	-	-	-			
	1996	-	-	-	-	-	-	-			
	1997	-	-	-	-	-	-	-		-	
	1998	-	-	-	-	-	-	-		-	
	1999	-	-	-	-	-	-	-		-	
	2000	-	-	-	-	-	-	-		-	
	2001	-	-	-	-	-	-	-		-	
	2002										
	2003	-	-	-	-	-	-	-		-	-
	2004	-	-	-	-	-	-	-		-	-
Noatak	1994	-	1	(52)	-	(1)	-	-	7	316	
	1995	1	-	1	-	-	-		100		
	1996	-	-	-	-	-	-		-		
	1997	-	-	-	-	-	-		-	-	
	1998	-	-	-	-	-	-		-	-	
	1999	-	-	-	-	-	-		-	-	
	2000	-	-	9	-	-	-		-	-	
	2001	-	-	-	-	-	-		-	-	
	2002	-	-	-	-	-	-		-	-	
	2003	-	-	-	-	-	-		-	-	
	2004	-	-	-	-	-	-		-	-	

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Table A-5.–Page 2 of 2.

Differences between original reported harvests and this project's data set ^a										
	Year	Households Surveyed	Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish	Dolly Varden	Whitefish
Noorvik	1994	-	-	-	-	-	-	-		
	1995	1	-	-	-	-	-	-		
	1996	-	-	-	-	-	-	-		
	1997	1	-	-	-	-	-	-		-
	1998	-	-	-	-	-	-	-		-
	1999	-	-	-	-	-	-	-		-
	2000	-	-	-	-	-	-	-		-
	2001	-	-	-	-	-	-	-		-
	2002	-	-	-	-	-	-	-		-
	2003	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-
Shungnak	1994	-	-	-	-	-	-	-		
	1995	1	-	1	-	-	-	10		
	1996	-	-	-	-	-	-	-		
	1997	-	-	-	-	-	-	-		-
	1998	-	-	-	-	-	-	-		-
	1999	-	-	-	-	-	-	-		-
	2000	-	-	-	-	-	-	-		-
	2001	-	-	-	-	-	-	-		-
	2002	-	-	-	-	-	(1)	-	(7)	-
	2003	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	45	-

a. "-" indicates no difference

 = not surveyed or not included on survey

Table A-6.—Community populations and estimated harvests in original project reports.

	Year	Number of households in community	Estimated number of fish harvested							Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish			
Ambler	1994	74	0	6,444	5	0	0				
	1995	78	1	8,558	0	1	5	1,980			
	1996	82	1	9,062	6	65	2	1,215			
	1997	83	0	2,713	1	14	5	1,546		15,052	
	1998	80	0	2,432	0	2	2	942		3,326	
	1999	71	0	590	100	0	0	559		8,170	
	2000	70	0	5,009	0	0	0	1,672		35,118	
	2001										
	2002										
	2003	67	9	1,719	48	64	1	743	246	14,348	
2004	63	33	3,446	25	6	3	2,416	106	5,868		
Kiana	1994	104	0	4,060	0	22	0	854			
	1995	101	0	5,985	0	7	0	1,480			
	1996	103	6	5,935	12	0	0	1,003			
	1997	108	0	3,064	138	6	0	1,278		21,877	
	1998	102	29	3,414	17	6	0	572		5,188	
	1999	91	5	3,788	33	7	0	657		5,464	
	2000	88	0	2,876	107	0	74	1,385		8,867	
	2001	87	0	5,379	0	0	0	1,200		7,118	
	2002										
	2003	95	15	3,010	68	80	0	915	96	10,899	
2004	87	3	3,896	61	45	0	1,840	117	6,041		
Kobuk	1994	24	3	6,369	0	0	0	781			
	1995	27	1	2,959	0	0	0	827			
	1996	24	0	1,819	1	0	0	450			
	1997	26	0	629	0	0	0	814		1,420	
	1998	25	0	1,031	0	0	0	397		1,115	
	1999	23	0	1,869	0	0	0	614		871	
	2000	30	0	318	0	0	0	140		805	
	2001	26	0	2,843	0	1	1	32		0	
	2002										
	2003	34	2	1,453	0	18	0	793	0	9,257	
2004	28	3	3,087	6	1	0	1,218	20	5,302		
Noatak	1994	84	4	5,771	185	0	0	98	4,629		
	1995	92	0	6,359	111	0	0		5,762		
	1996	88	0	10,091	0	0	1		5,692		
	1997	84	4	5,309	9	0	0		4,763	2,363	
	1998	97	5	2,614	0	6	2		3,872	4,320	
	1999	91	0	1,616	0	10	0			1,375	
	2000	102	0	7,293	87	3	2	123	3,315	2,664	
	2001	96	0	2,326	116	0	0		2,702	2,443	
	2002	101	0	2,937	11	0	0		3,242	2,919	
	2003	104	1	2,177	28	17	10	2	5,670	4,387	
	2004	105	10	3,997	518	756	12	72	10,914	8,510	

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Table A-6.–Page 2 of 2.

		Number of households in community	Estimated number of fish harvested							Dolly Varden	Whitefish
	Year		Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish			
Noorvik	1994	122	2	10,649	0	0	0				
	1995	126	8	15,485	47	34	1	3,538			
	1996	124	38	13,611	256	597	0	3,362			
	1997	124	9	14,323	677	78	80	5,048		30,938	
	1998	129	21	9,845	140	224	0	1,605		16,677	
	1999	118	4	17,843	0	8	0	4,034		30,809	
	2000	112	5	10,391	1,722	71	0	3,276		15,621	
	2001	108	6	16,444	652	10	0	1,658		14,711	
	2002	115	3	13,943	44	8	9	4,310		22,688	
	2003	138	13	7,982	895	381	1	3,473	285	16,175	
2004	133	8	6,025	912	443	3	2,873	435	13,287		
Shungnak	1994	55	0	8,611	0	1	0	1,349			
	1995	53	0	5,880	0	0	0	1,641			
	1996	56	0	8,649	0	0	0	924			
	1997	57	2	5,513	0	0	0	1,120		13,201	
	1998	56	0	4,676	42	0	0	1,834		9,128	
	1999	51	0	3,868	0	0	0	2,293		9,637	
	2000	46	0	2,944	1	0	0	850		7,023	
	2001	46	0	4,310	0	0	0	947		6,705	
	2002	54	0	3,810	1	35	1	2,020	95	21,625	
	2003	50	0	2,860	3	23	41	1,886	88	18,175	
	2004	56	0	4,186	8	8	0	1,745	106	11,493	

a. Data collected during comprehensive community surveys.

= not surveyed or not included on survey

Table A-7.-Community populations and estimated harvests in this project's data sets.

	Year	Number of households in community	Estimated number of fish harvested							Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish			
Ambler	1994	74	0	17,758	9	0	0	3,051			
	1995	78	1	8,649	0	1	6	2,010			
	1996	82	1	8,875	6	64	2	1,192			
	1997	83	0	2,713	1	14	5	1,546		15,052	
	1998	80	0	2,432	0	2	2	942		3,326	
	1999	71	0	1,952	330	0	0	1,887		27,664	
	2000	70	0	5,009	0	0	0	1,672		35,118	
	2001									70	
	2002									70	
	2003	67	9	1,719	48	64	1	743	246	14,348	
2004	60	32	3,338	24	6	3	2,319	102	5,635		
Kiana	1994	104	0	4,060	0	22	0	854			
	1995	101	0	5,593	0	6	0	1,389			
	1996	103	6	3,882	12	0	0	1,003			
	1997	108	0	2,246	138	6	0	1,278		21,877	
	1998	102	29	3,414	17	6	0	572		5,188	
	1999	91	5	2,415	33	7	0	657		5,464	
	2000	88	0	944	107	0	74	695		8,867	
	2001	87	0	3,343	0	0	0	1,200		6,500	
	2002									87	
	2003	95	15	1,937	68	80	0	915	96	10,899	
2004	76	0	2,326	54	40	0	1,050	97	5,344		
Kobuk	1994	24	3	6,369	0	0	0	781			
	1995	27	1	2,935	0	0	0	829			
	1996	24	0	1,819	1	0	0	450			
	1997	26	0	629	0	0	0	814		1,420	
	1998	25	0	1,031	0	0	0	397		1,115	
	1999	23	0	1,869	0	0	0	614		871	
	2000	30	0	498	0	0	0	223		1,252	
	2001	26	0	2,843	0	1	1	32		0	
	2002									26	
	2003	34	2	1,453	0	18	0	793	0	9,257	
2004	28	3	3,087	6	1	0	1,218	20	5,302		
Noatak	1994 ^a	84	5	5,954	185	0	0	98	4,638	2,894	
	1995	68	0	5,430	113	0	0		5,124		
	1996	88	0	10,091	0	0	1		5,692		
	1997	84	4	5,309	9	0	0		4,763	2,363	
	1998	97	5	2,614	0	6	2		3,872	4,320	
	1999	91	0	10,974	0	68	0	680	0	9,350	
	2000	102	0	7,309	87	3	2	123	3,315	2,664	
	2001	96	0	2,326	116	0	0		2,702	2,205	
	2002	101	0	2,937	11	0	0		3,242	2,919	
	2003	104	1	2,177	28	17	10	2	5,670	4,387	
2004	103	10	3,997	518	756	12	70	10,757	8,502		

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Table A-7.–Page 2 of 2.

	Year	Number of households in community	Estimated number of fish harvested							Dolly Varden	Whitefish
			Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish			
Noorvik	1994	122	2	10,649	0	0	0	653			
	1995	126	8	15,161	46	33	1	3,527			
	1996	124	38	13,611	256	597	0	3,362			
	1997	124	9	14,322	677	78	80	5,027		30,862	
	1998	129	21	9,845	140	224	0	1,605		16,677	
	1999	118	4	17,843	0	8	0	4,034		30,809	
	2000	112	5	10,391	1,722	71	0	3,276		15,621	
	2001	108	6	16,444	652	10	0	1,658		17,239	
	2002	115	3	13,943	44	8	9	4,310		22,688	
	2003	138	13	7,982	895	381	1	3,473	285	16,175	
2004	125	8	5,822	881	428	3	2,764	420	12,801		
Shungnak	1994	55	0	8,611	0	1	0	1,349			
	1995	53	0	5,676	0	0	0	1,599			
	1996	56	0	8,649	0	0	0	924			
	1997	57	2	5,513	0	0	0	1,120		13,201	
	1998	56	0	4,676	42	0	0	1,834		9,128	
	1999	51	0	3,868	0	0	0	2,293		9,637	
	2000	46	0	2,944	1	0	0	850		7,023	
	2001	46	0	4,310	0	0	0	947		4,724	
	2002 ^a	54	0	3,810	1	35	0	2,020	88	21,625	
	2003	50	0	2,860	3	23	41	2,078	97	18,196	
	2004	47	0	3,620	7	7	0	1,476	147	9,913	

a. Data collected during comprehensive community surveys.

■ = not surveyed or not included on survey

Table A-8.–Summary of review of populations and estimated harvests.

		Differences between original estimated harvests and project data set ^a								
	Year	Households in Community	Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish	Dolly Varden	Whitefish
Ambler	1994	-	not expanded							
	1995	-	-	91	-	-	1	30		
	1996	-	-	(187)	-	(1)	-	(23)		
	1997	-	-	-	-	-	-	-		-
	1998	-	-	-	-	-	-	-		-
	1999	-	-	1,362	230	-	-	1,328		19,494
	2000	-	-	-	-	-	-	-		-
	2001	not surveyed								
	2002	not surveyed								
	2003	-	-	-	-	-	-	-	-	-
	2004	(3)	(1)	(108)	(1)	-	-	(97)	(4)	(233)
Kiana	1994	-	-	-	-	-	-	-		
	1995	-	-	(392)	-	(1)	-	(91)		
	1996	-	-	-	-	-	-	-		
	1997	-	-	-	-	-	-	-		-
	1998	-	-	630	-	-	-	-		-
	1999	-	-	-	-	-	-	-		-
	2000	-	-	-	-	-	-	(690)		-
	2001	-	-	-	-	-	-	-		(618)
	2002									
	2003	-	-	-	-	-	-	-	-	-
	2004	(11)	-	(303)	(7)	(5)	-	(790)	(20)	(697)
Kobuk	1994	-	-	-	-	-	-	-		
	1995	-	-	(24)	-	-	-	2		
	1996	-	-	-	-	-	-	-		
	1997	-	-	-	-	-	-	-		-
	1998	-	-	-	-	-	-	-		-
	1999	-	-	-	-	-	-	-		-
	2000	-	-	180	-	-	-	83		447
	2001	-	-	-	-	-	-	-		-
	2002	not surveyed								
	2003	-	-	-	-	-	-	-	-	-
	2004	-	-	-	-	-	-	-	-	-
Noatak	1994	-	1	183	-	-	-	-	9	2,894
	1995	(24)	-	(929)	2	-	-		(638)	
	1996	-	-	-	-	-	-		-	
	1997	-	-	-	-	-	-		-	-
	1998	-	-	-	-	-	-		-	-
	1999	-	not expanded							
	2000	-	-	16	-	-	-		-	-
	2001	-	-	-	-	-	-		-	(238)
	2002	-	-	-	-	-	-		-	-
	2003	-	-	-	-	-	-	-	-	-
	2004	(2)	-	-	-	-	-	(2)	(157)	(8)

- continued -

Table A-8.–Page 2 of 2.

Differences between original estimated harvests and project data set ^a												
	Year	Households in Community	Chinook salmon	Chum salmon	Coho salmon	Pink salmon	Sockeye salmon	Sheefish	Dolly Varden	Whitefish		
Noorvik	1994	-	-	-	-	-	-	653				
	1995	-	-	(324)	(1)	(1)	-	(11)				
	1996	-	-	-	-	-	-	-				
	1997	-	-	(1)	-	-	-	(21)			(76)	
	1998	-	-	-	-	-	-	-			-	
	1999	-	-	-	-	-	-	-			-	
	2000	-	-	-	-	-	-	-			-	
	2001	-	-	-	-	-	-	-			2,528	
	2002	-	-	-	-	-	-	-			-	
	2003	-	-	-	-	-	-	-			-	
	2004	(8)	-	(203)	(31)	(15)	-	(109)	(15)	(486)		
Shungnak	1994	-	-	-	-	-	-	-				
	1995	-	-	(204)	-	-	-	(42)				
	1996	-	-	-	-	-	-	-				
	1997	-	-	-	-	-	-	-			-	
	1998	-	-	-	-	-	-	-			-	
	1999	-	-	-	-	-	-	-			-	
	2000	-	-	-	-	-	-	-			-	
	2001	-	-	-	-	-	-	-			(1,981)	
	2002	-	-	-	-	-	(1)	-			(7)	-
	2003	-	-	-	-	-	-	192			9	21
	2004	(9)	-	(566)	(1)	(1)	-	(269)	41	(1,580)		

a. "-" indicates no difference

 = not surveyed or not included on survey

APPENDIX B: PROJECT MATERIALS

PATTERNS & TRENDS **in** **SUBSISTENCE FISHING**

A Study of Change in
Ambler
Kiana
Kobuk
Noatak
Noorvik
Shungnak



From 1994 through 2004, Maniilaq Association, the Alaska Department of Fish and Game, and the National Park Service conducted salmon harvest surveys every year in six northwest Alaska communities: Ambler, Kiana, Kobuk, Noatak, Noorvik, and Shungnak.

During that time, salmon harvests declined in all six communities. But harvests of other fish (like whitefish) increased in some communities, sometimes making up for declines in salmon. In other communities, harvests of all fish declined. In all six communities combined, total fish harvests showed no significant trend up or down.

During that same time, many things changed. Summers grew warmer and freeze-up came later. More people found work and earned more money. But food prices increased by 25%, while gas and oil prices more than doubled.

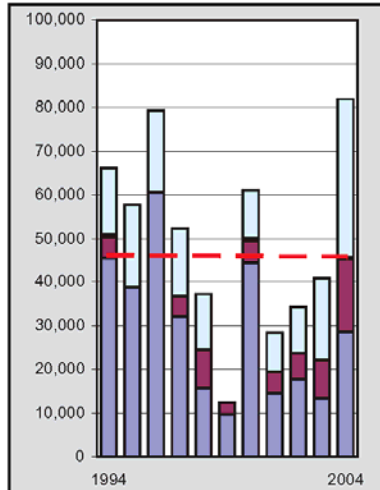
Maniilaq Association and ADF&G would like to better understand patterns and trends in subsistence fish harvests in the Northwest Arctic Borough. With funding from the U.S. Fish and Wildlife Service, they are exploring community harvests of salmon, trout, whitefish, and sheefish from 1994 through 2004.

In two communities – Noatak and Shungnak – researchers plan to work with high school science teachers and students to review their communities' harvests and explore reasons that harvests might have changed.

At the risk of stating the obvious, changes in community harvests reflect changes in harvests by individuals and families. In an unusual feature of the study, researchers and students will invite selected fishing households

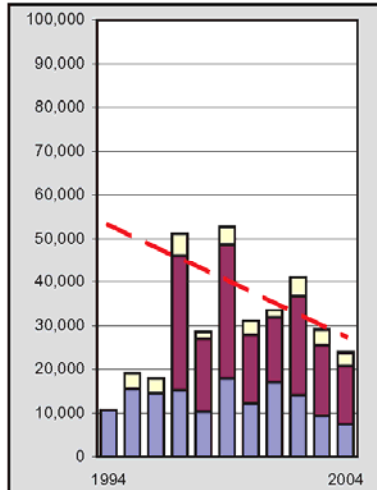
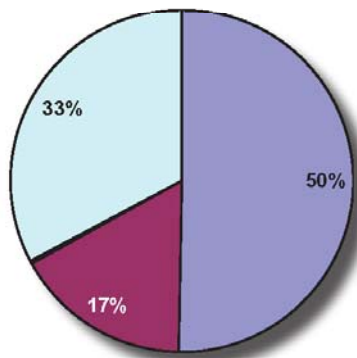
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Estimated Pounds of ■ **Salmon** ■ **Whitefish** ■ **Sheefish &** ■ **Trout**



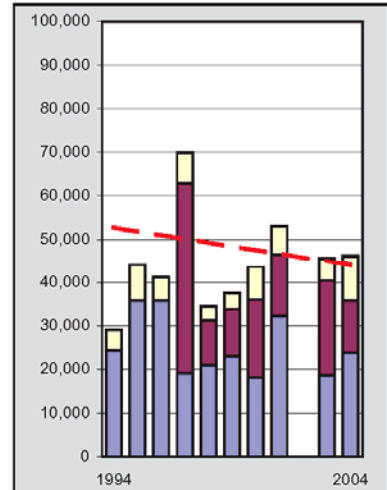
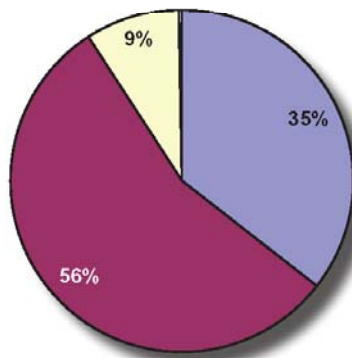
Noatak

From 1994 to 2004, salmon harvests in Noatak declined from about 45,000 pounds in 1994 to about 25,000 in 2004 (*above*). But harvests of trout and whitefish increased. The estimated total harvest did not change significantly between 1994 and 2004. About half the fish harvested (*below*) were salmon, about one third were trout, and about one fifth were whitefish with a few sheefish.



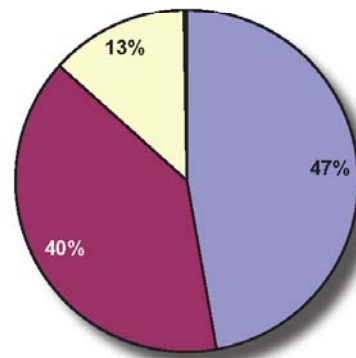
Noorvik

Although overall, fish harvests in Noorvik seemed to decline substantially (*dotted red line*), that is not the whole story. Salmon harvests did decline. But whitefish were not included in the survey the first three years (or in the trend line). In 1998 and 2000, Noorvik whitefish harvests were twice the average, which may be unusual. Those high harvests may make it look like fish harvests have declined.

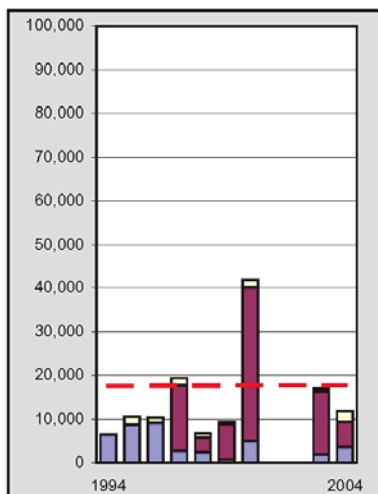


Kiana

In Kiana, harvests of all three major fish species – salmon, whitefish, and sheefish – declined by 3% to 4% per year. But, as in Noorvik, an unusually large whitefish harvest in 1998 may make the decline seem greater than it really was. From 1999 to 2003, harvests increased. Salmon were the largest part of the subsistence fish harvest (*below*), 47%. There was no survey in 2002.

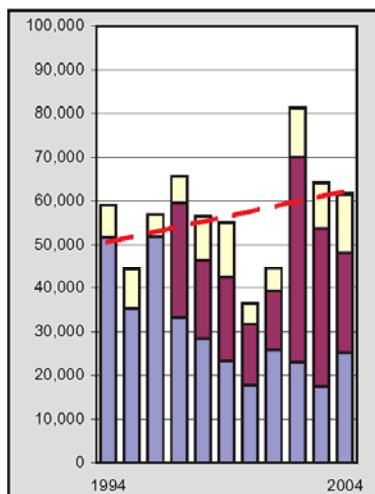
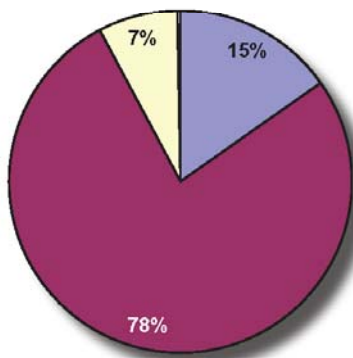


Harvested by Year by Six Northwest Alaska Communities, 1994-2004



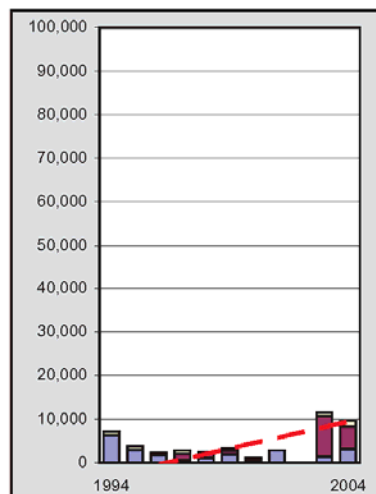
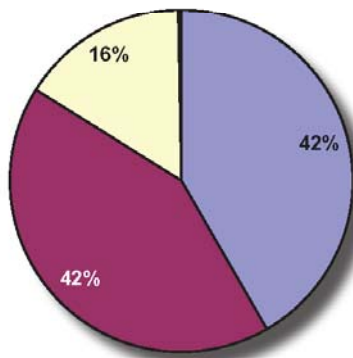
Ambler

Ambler's fish harvests were lower than their neighbors, suggesting greater reliance on other species like caribou. Harvests varied a lot from year to year; especially in 2000 when more than 35,000 pounds of whitefish were harvested. But there was no significant trend in the total fish harvest. Partly because of the high harvest in 2000, whitefish made up 78% of the total fish harvest in Ambler.



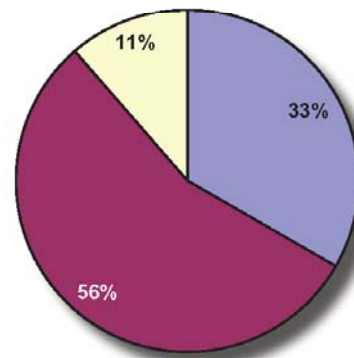
Shungnak

Like Noatak, Shungnak has seen a remarkable decline in salmon harvests, from about 50,000 in 1994 to about 25,000 in 2004. But whitefish and sheefish harvests increased even faster than salmon harvests declined, so the overall fish harvest (in pounds) has increased. Understanding such changes is one of our goals. Salmon and whitefish each made up 42% of the total fish harvest.

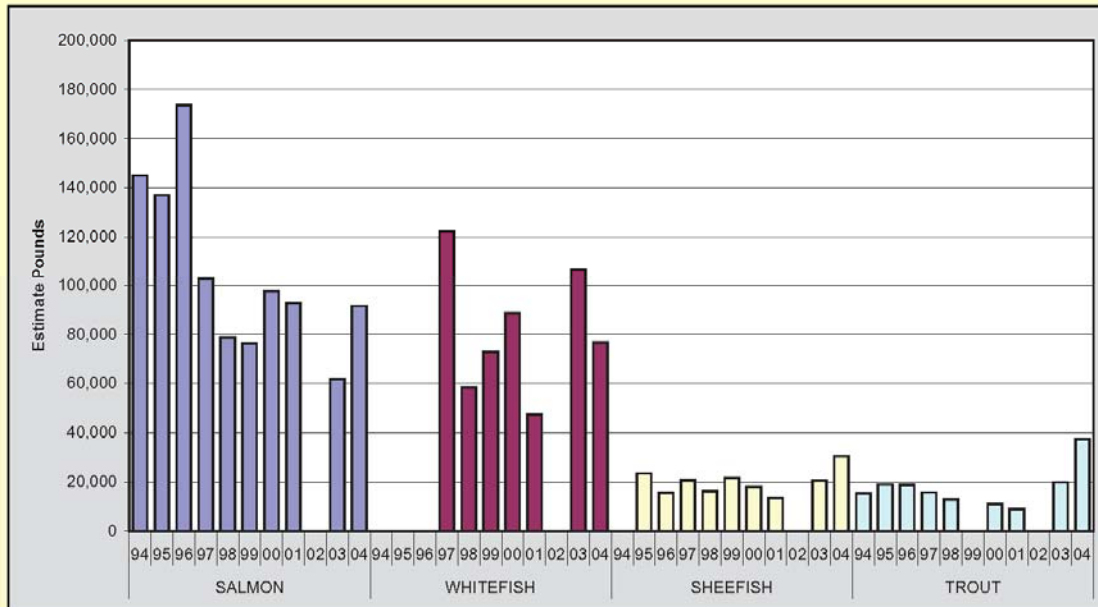


Kobuk

The smallest community in the region had, as would be expected, the smallest harvests. But recent harvests in Kobuk have been much higher than harvests in the mid 1990s. As in Shungnak, salmon harvests were declining, but whitefish harvests were increasing. In 2003 and 2004, Kobuk residents harvested almost 10 times as many whitefish as they did 10 years ago.



Estimated Total Fish Harvests in Six Communities, by Species and by Year



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to participate in the analysis by reviewing their own households' 11-year harvests and providing explanations for their own fishing histories.

There are many reasons fish harvests may change. Most obviously, people may catch more fish when there are more fish to catch. But weather, water levels, work, and people's age and health can also affect fish harvests.

Survey data show that older people's households harvest more fish than younger people's households. On one hand, households that work may have enough money to fish, but not enough time. On the other hand, households that do not work may have enough time to fish, but not enough money.

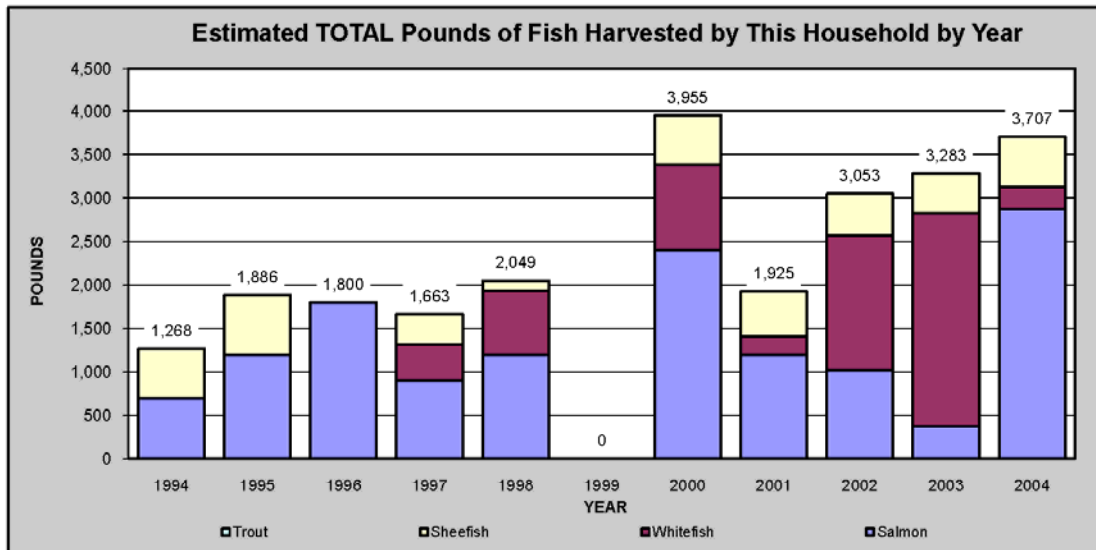
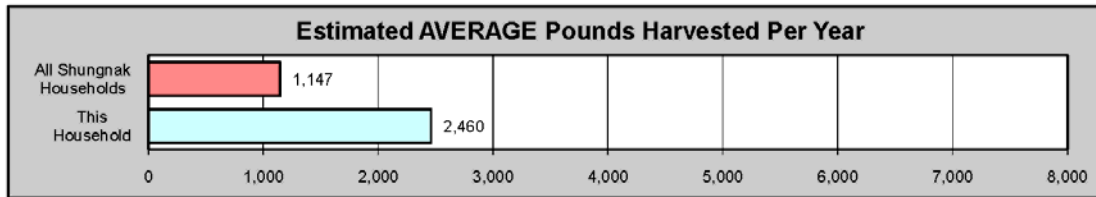
We believe there are two good ways to better understand the challenges subsistence users face. First, we need to gather information about subsistence harvests, as the salmon surveys have done. Second, we need to share our data with subsistence users and listen to what they say.

We look forward to working with our communities, and our students, in this study.

This study is funded by the U.S. Fish and Wildlife Service, Office of Subsistence Management, Fisheries Resource Monitoring Program
Study No. 07-151 under contract number 701817C285.

Appendix B-2.-Household fishing history.

HOUSEHOLD FISHING HISTORY, 1994-2004 HOUSEHOLD 4



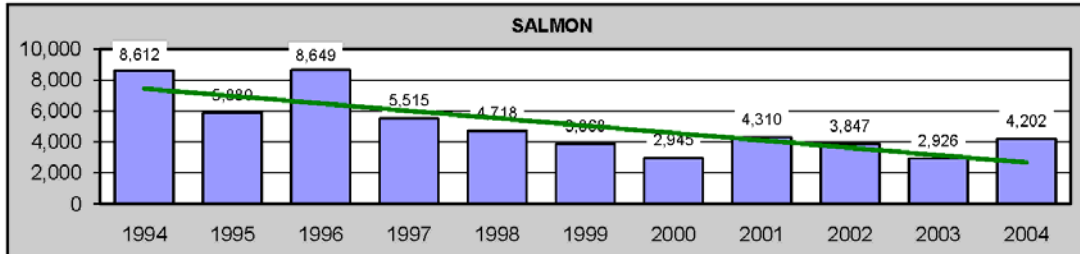
It looks like your household harvested about 2460 POUNDS of fish each year. Your household's SALMON harvests stayed about the same. Your household's WHITEFISH harvests went up by about 77 whitefish a year. Your household's SHEEFISH harvests stayed about the same. Is this how you remember your harvests?

HOUSEHOLD SURVEY HISTORY											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Surveyed?	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
HH Size	4	3	0	3	4	--	4	-9	3	1	1

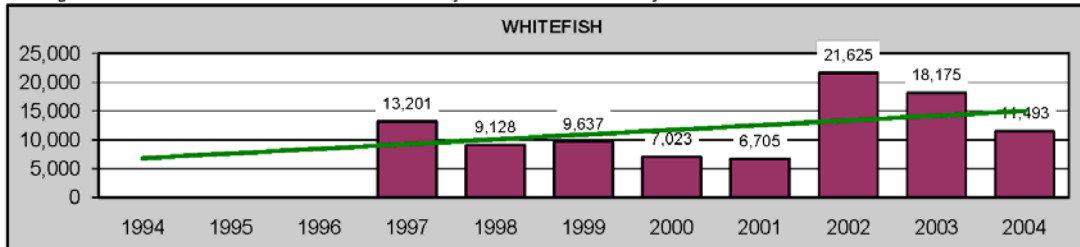
REPORTED NUMBER OF FISH											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Salmon	116	200	300	150	200	--	400	200	170	62	480
Whitefish				300	525	--	702	150	1,109	1,750	180
Sheefish	50	60	0	30	10	--	50	45	42	40	50
Trout									0	1	1
TOTAL	166	260	300	480	735	--	1,152	395	1,321	1,853	711

ESTIMATED POUNDS OF FISH											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Salmon	696	1,200	1,800	900	1,200	--	2,400	1,200	1,020	372	2,880
Whitefish				420	735	--	983	210	1,553	2,450	252
Sheefish	572	686	0	343	114	--	572	515	480	458	572
Trout									0	3	3
TOTAL	1,268	1,886	1,800	1,663	2,049	--	3,955	1,925	3,053	3,283	3,707

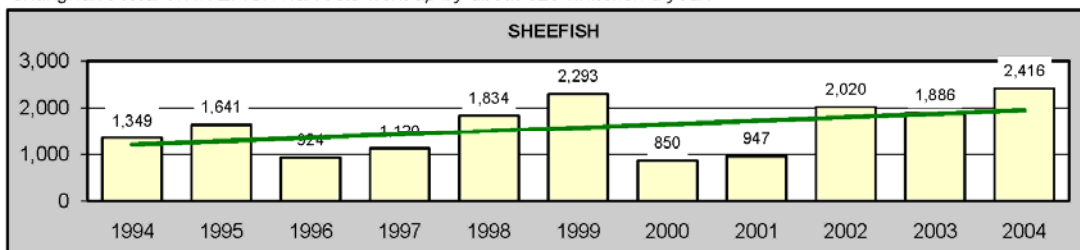
ESTIMATED SHUNGNAK FISH HARVESTS, 1994-2004



Shungnak's total SALMON harvests went down by about 280 salmon a year.



Shungnak's total WHITEFISH harvests went up by about 820 whitefish a year.



Shungnak's total SHEEFISH harvests went up by about 75 sheefish a year.

COMMUNITY SURVEY HISTORY											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
N of HHs Surveyed	52	44	51	47	50	28	34	42	51	33	47
Community Pop.	241	243	250	250	259	255	256	245	249	263	266

ESTIMATED NUMBER OF FISH											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Salmon	8,612	5,880	8,649	5,515	4,718	3,868	2,945	4,310	3,847	2,926	4,202
Whitefish				13,201	9,128	9,637	7,023	6,705	21,625	18,175	11,493
Sheefish	1,349	1,641	924	1,120	1,834	2,293	850	947	2,020	1,886	2,416
Trout									95	88	106
TOTAL NUMBER	9,961	7,521	9,572	19,836	15,680	15,797	10,818	11,961	27,588	23,076	18,216

ESTIMATED POUNDS OF FISH											
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Salmon	51,671	35,279	51,892	33,092	28,307	23,207	17,673	25,859	23,080	17,556	25,212
Whitefish				18,482	12,779	13,491	9,832	9,386	30,276	25,446	16,090
Sheefish	15,429	18,770	10,569	12,813	20,979	26,229	9,722	10,834	23,111	21,579	27,638
Trout									314	292	348
TOTAL POUNDS	67,100	54,050	62,461	64,387	62,065	62,927	37,226	46,080	76,782	64,872	69,288

Appendix B-3.-Interview protocol.

INTERVIEW PROTOCOL

PATTERNS & TRENDS IN SUBSISTENCE FISHING

SHUNGNAK (312)

HOUSEHOLD ID	
INTERVIEW DATE	
INTERVIEWER 1	
INTERVIEWER 2	
START TIME	
STOP TIME	

Show respondent their household's fishing chart, and explain if necessary. Then say... I'd like you to review your household's fish harvests from 1994 to 2004. Then I'd like to talk with you about your household's fishing...

Is this how you remember your household's fish harvests?

NO YES IDK ☐

Do you have any comments?

(circle one)

Write down comments above...

If this is NOT how you remember your harvests, in which years do you remember higher or lower harvests of...

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
...SALMON?	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L
...WHITEFISH?	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L
...SHEEFISH?	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L
...TROUT?	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L	H L

Circle "H" or "L" in each different year. Leave other years BLANK.

I would like you to think back on your household's fishing history between 1994 and 2004. I am going to ask you about things that affected your fishing. Let's start with the MOST IMPORTANT thing.

What was the SINGLE MOST IMPORTANT THING that affected your household's fishing between 1994 and 2004?

--	--

Briefly describe factor above...

How did that affect your fishing?

Write down comments above...

In which years did that affect your fishing?

Did that cause your harvest to go UP, to go DOWN, or did it not change your harvest?

IDK	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D
NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?

For each year in which fishing was affected, circle ONE affect U=UP D=Down NC=No Change ? = "I don't know"

SHUNGNAK: 312

PATTERNS and TRENDS INTERVIEW PROTOCOL

FISHING FACTORS 2 & 3

HOUSEHOLD ID

Did anything else affect your fishing?

NO YES IDK

(circle one)

If YES, what was the NEXT MOST IMPORTANT THING that affected your HH's fishing between 1994 and 2004?

--

Briefly describe factor above...

How did that affect your fishing?

Write down comments above...

In which years did that affect your fishing?

Did that cause your harvest to go UP, to go DOWN, or did it not change your harvest?

IDK	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D
NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?

For each year in which fishing was affected, circle ONE effect. U=UP. D=Down. NC=No Change. ? = "I don't know"

Did anything else affect your fishing?

NO YES IDK

(circle one)

If YES, what was the NEXT MOST IMPORTANT THING that affected your HH's fishing between 1994 and 2004?

--

Briefly describe factor above...

How did that affect your fishing?

Write down comments above...

In which years did that affect your fishing?

Did that cause your harvest to go UP, to go DOWN, or did it not change your harvest?

IDK	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D	U D
NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?	NC ?

For each year in which fishing was affected, circle ONE effect. U=UP. D=Down. NC=No Change. ? = "I don't know"

SHUNGNAK: 312

PATTERNS and TRENDS INTERVIEW PROTOCOL

OTHER FISHING FACTORSHOUSEHOLD ID

I am going to read a list of things that we thought might have affected your household's subsistence fish harvests. I would like to know which of these things, if any, affected your household.

If we come to one of the THREE things we talked about already, we'll SKIP it.

Did ()
Affect
Your
Fishing?
(circle)

If YES, in what year or years did this affect your household?
If YES, did this cause your harvests to go UP or DOWN,
or did it NOT CHANGE your harvest?
(Circle U, D, NC, or ? in the affected years only. Leave other years blank.)

IDK 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004

Environmental Factors

S=SKIP

U=UP D=Down NC=No Change ? = "I don't know"

unusual weather	N Y S
unusual water levels	N Y S
the number of fish	N Y S
the condition of fish	N Y S
the taking of fish by predators (bears, seals)	N Y S
contamination of land or water	N Y S

U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?

Financial Factors

S=SKIP

U=UP D=Down NC=No Change ? = "I don't know"

the condition of your boat or motor	N Y S
the availability of a net	N Y S
the cost of gasoline	N Y S
the availability of gasoline	N Y S
the cost of store food	N Y S
the availability of store food	N Y S

U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?

Household Factors

S=SKIP

U=UP D=Down NC=No Change ? = "I don't know"

the number of people in your household	N Y S
the ages of people in your household	N Y S
the health of people in your household	N Y S
the food preferences of people in your household	N Y S

U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?

Regulatory Factors

S=SKIP

U=UP D=Down NC=No Change ? = "I don't know"

Fish and Game regulations	N Y S
the game warden	N Y S

U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?

Employment

S=SKIP

U=UP D=Down NC=No Change ? = "I don't know"

working at a job	N Y S
------------------	-------

U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?	U D NC ?
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

SHUNGNAK: 312

PATTERNS and TRENDS INTERVIEW PROTOCOL

COMMUNITY HARVEST REVIEW

HOUSEHOLD ID

Show respondent Shungnak summary chart. So far, we've talked about your HOUSEHOLD'S fishing. Now I'd like you to review SHUNGNAK's fish harvests from 1994 to 2004. Then I'd like to talk with you about SHUNGNAK's fishing...

Shungnak's **SALMON** harvests **SEEM** to be going **DOWN**. Does it seem to **YOU** that Shungnak's salmon harvests are going up, down, or not changing?

U D NC IDK
(circle one)

Why do you think that is happening?

Write down comments above...

Shungnak's **WHITEFISH** harvests **SEEM** to be going **UP** Does it seem to **YOU** that Shungnak's whitefish harvests are going up, down, or not changing?

U D NC IDK
(circle one)

Why do you think that is happening?

Write down comments above...

Shungnak's **SHEEFISH** harvests **SEEM** to be going **UP** Does it seem to **YOU** that Shungnak's sheefish harvests are going up, down, or not changing?

U D NC IDK
(circle one)

Why do you think that is happening?

Write down comments above...

In your opinion, what was the **SINGLE MOST IMPORTANT THING** that affected Shungnak's fishing between 1994 and 2004?

Write down comments above...

In your opinion, what was the **NEXT MOST IMPORTANT THING** that affected Shungnak's fishing between 1994 and 2004?

Write down comments above...

In your opinion, what was the **NEXT MOST IMPORTANT THING** that affected Shungnak's fishing between 1994 and 2004?

Write down comments above...

SHUNGNAK: 312

Appendix B-4.-Data collection and verification sheet.

Data Verification & Collection Sheet

Kotzebue Sound Patterns & Trends

Household ID

Community SHUNGNAK

Interviewer's Initials _____

Source of this data?

(circle one)

MEMBER OF
THIS HOUSEHOLD

KEY RESPONDENT
(HH ID _____)

1. Was this household surveyed under different IDs?

(circle one) YES NO

If YES, list the original survey numbers for EACH YEAR.

Leave corrected number blank for now.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1a. Original Survey Number	HH ID											
1b. Corrected HH Number?	HH ID											
1c. Merge with another household...	HH ID											

2. Did this household first appear in the survey AFTER 1994?

(circle one) YES NO

If YES, where did the household members come from?

Enter data in the first year they were surveyed. Leave other years blank.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
2a. Another HH here?	Previous HH ID											
2b. Another Community?	Community											
2c. Had HH members lived here before	Y, N											

3. Did this household disappear from the survey AFTER 1994?

(circle one) YES NO

If YES, where did the household members go?

Enter data in the first year they were gone. That is, the first year they were NOT surveyed. Leave other years blank.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
3a. Another HH here?	New HH ID											
3b. Another Community?	Community											

4. In each year between 1994 & 2003, did a HEAD or MEMBER of this household have a COMMERCIAL fishing permit?

(circle one) YES NO

Check list of permit holders, and mark each year that a permit was held for salmon, herring, or other species. Leave other years blank.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Salmon	H, M, H+M											
Herring	H, M, H+M											
Other Species	H, M, H+M											

5. In each year between 1994 and 2003, was this household headed by a MALE, FEMALE, or COUPLE?

In each year, write "M" for a single male, "F" for a single female, or "2" for a couple in the table below, for every year.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Male Head, Female Head, or Couple?	M,F,2											

6. Was the head of this household a YOUNG person, MATURE person, ELDER, or TEACHER?

Check PFD list. Mark ONE category for EACH year. If necessary, change category as the oldest head of household ages.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
0 to 39 Years (Young Household)	Y											
40-59 Years (Mature Household)	M											
60 years or older (Elder Household)	E											
Teacher Household (Any Age)	T											

7. Between 1994 & 2003, did a head of this household pass away, get married, or get divorced?

(circle one)

YES

NO

If YES, record changes in the year they happened. Leave other years blank.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Household Head (M or F) Died?	M, F											
Household Head (M or F) Married?	X											
Heads Separated or Divorced	X											

APPENDIX C: ORIGINAL ANNUAL SURVEYS

[illegible]

COMM. ID# _____
HHID# _____

**1995 KOTZEBUE SOUND / KOBUK RIVER
POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY**

* Questions marked with an asterisk are asked of all households interviewed

Community: _____ Household Head Name: _____
Survey Date: _____ Name of Person Interviewed: _____
Interviewer: _____ Household P.O. Box: _____
*Household Size _____
Was household in community last year? No ____ Yes ____
If no, where were you living? _____

- *1. Did your household catch salmon for subsistence use this year?** No ____ Yes ____
***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS

3. Please estimate how many salmon your household caught for subsistence use this year (your share of the catch if fishing with others). Include salmon you caught and gave away or lost to spoilage.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. How much of your salmon catch did you give to other families this year? (circle)

NONE SOME ABOUT HALF MOST ALMOST ALL ALL
(0%) (1 -25%) (26 - 50%) (51 -75%) (75 -99%) (100%)

5. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

DRIFT NET _____ SET NET _____ SEINE _____ ROD-AND-REEL _____

OTHER (IDENTIFY) _____

6. Did your household catch salmon for dog food?

No ____ (Go to #12) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #12) Yes ____

7. How many salmon? (Do **not** include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

8. Were the salmon caught for dog food included in the estimates you already gave me? No ____ Yes ____

9. How many dogs does your household have? _____

HHID# _____

**1995 KOTZEBUE SOUND / KOBUK RIVER
POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)**

NON-FISHING HOUSEHOLDS (Household did not help harvest/catch salmon)

10. Did your household help another household process ("put up") salmon? No _____ (Go to #12) Yes _____

11. Please estimate how many salmon you kept for your household only.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #12)

COMMERCIAL FISHING

***12. Did your household commercial fish for salmon this year?** No _____ (Go to #16) Yes _____
If yes, where? _____

13. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #16) Some used for subsistence _____

14. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

15. Are those salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH FISHING

***16. Did your household catch sheefish for subsistence use this year?** No _____ (Go to #18) Yes _____

17. Please estimate how many sheefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include sheefish you caught and gave away or lost to spoilage. _____

***18. Were your household's subsistence salmon needs met this year?** No _____ Yes _____ (Go to #19)
If no, why not?

***19. Do you have any suggestions or comments?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMM. ID# _____
HHID# _____

**1995 KOTZEBUE SOUND / NOATAK RIVER
POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY**

* Questions marked with an asterisk are asked of all households interviewed

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
Name of Person Interviewed: _____
Household P.O. Box: _____
***Household Size** _____
Was household in community last year? No ____ Yes ____
If no, where were you living? _____

- *1. Did your household catch salmon for subsistence use this year?** No ____ Yes ____
***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS

3. Please estimate how many salmon your household caught for subsistence use this year (your share of the catch if fishing with others). Include salmon you caught and gave away or lost to spoilage.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. How much of your salmon catch did you give to other families this year? (circle)

NONE SOME ABOUT HALF MOST ALMOST ALL ALL
(0%) (1 -25%) (26 - 50%) (51 -75%) (75 -99%) (100%)

5. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

DRIFT NET _____ SET NET _____ SEINE _____ ROD-AND-REEL _____
OTHER (IDENTIFY) _____

6. Did your household catch salmon for dog food?
No ____ (Go to #12) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #12) Yes ____

7. How many salmon? (Do **not** include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

8. Were the salmon caught for dog food included in the estimates you already gave me? No ____ Yes ____

9. How many dogs does your household have? _____

HHID# _____

**1995 KOTZEBUE SOUND / NOATAK RIVER
POST-SEASON SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)**

NON-FISHING HOUSEHOLDS (Household did not help harvest/catch salmon)

10. Did your household help another household process ("put up") salmon? No _____ (Go to #12) Yes _____

11. Please estimate how many salmon you kept for your household only.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #12)

COMMERCIAL FISHING

***12. Did your household commercial fish for salmon this year?** No _____ (Go to #16) Yes _____
If yes, where? _____

13. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #16) Some used for subsistence _____

14. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SPECIES _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

15. Are those salmon included in the estimates you already gave me? No _____ Yes _____

TROUT/CHAR FISHING

***16. Did your household catch trout (char) for subsistence use this year?** No _____ (Go to #18) Yes _____

17. Please estimate how many trout (char) your household caught for subsistence use this year (your share of the catch if fishing with others). Include trout you caught and gave away or lost to spoilage. _____

***18. Were your household's subsistence salmon needs met this year?** No _____ Yes _____ (Go to #19)
If no, why not?

***19. Do you have any suggestions or comments?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMM. ID# _____
HHID# _____

**1996 KOTZEBUE SOUND / KOBUK RIVER
SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY**

* Questions marked with an asterisk are asked of all households interviewed

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
Household P.O. Box: _____
***Household Size** _____
Was household in community last year? No ____ Yes ____
If no, where were you living? _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you caught and gave away or lost to spoilage.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. How much of your salmon catch did you give to other families this year? (circle)

NONE SOME ABOUT HALF MOST ALMOST ALL ALL
(0%) (1 -25%) (26 - 50%) (51 -75%) (75 -99%) (100%)

5. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET NET _____ DRIFT NET _____
SEINE _____ OTHER (IDENTIFY) _____
ROD-AND-REEL _____

How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

6. How was subsistence salmon fishing for your household this year?

SALMON (CHUM) : ____ VERY GOOD ____ AVERAGE ____ POOR IF POOR, WHY? _____

7. Did your household catch salmon for dog food?

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____

8. How many salmon did your household catch for dog food? (Do **not** include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were the salmon caught for dog food included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____

HHID# _____

**1996 KOTZEBUE SOUND / KOBUK RIVER
SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)**

NON-FISHING HOUSEHOLDS (Household did not harvest/catch salmon)

11. Did your household help another household cut or hang salmon or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? Yes _____ No _____
If yes, please estimate how many salmon you received for your household.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPES") ("REDS") ("SILVERS")

(Go to

#13)

COMMERCIAL FISHING

***13. Did your household commercial fish for salmon this year?** No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPES") ("REDS") ("SILVERS")

16. Are those salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH FISHING

***17. Did your household catch sheefish for subsistence use this year?** No _____ (Go to #20) Yes _____

18. Please estimate how many sheefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include sheefish you caught and gave away or lost to spoilage. _____

19. How was sheefish fishing this year?

___ VERY GOOD ___ AVERAGE ___ POOR IF POOR, WHY? _____

***20. In your opinion, what could Fish and Game do to make subsistence salmon fishing better?**

***21. Do you have any other suggestions or comments?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMM. ID# _____
HHID# _____

**1996 KOTZEBUE SOUND / NOATAK RIVER
SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY**

* Questions marked with an asterisk are asked of all households interviewed

Community: _____
Survey Date: _____
Interviewer: _____

Household Head Name: _____
Household P.O. Box: _____
***Household Size** _____
Was household in community last year? No ____ Yes ____
If no, where were you living? _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you caught and gave away or lost to spoilage.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. How much of your salmon catch did you give to other families this year? (circle)

NONE SOME ABOUT HALF MOST ALMOST ALL ALL
(0%) (1 -25%) (26 - 50%) (51 -75%) (75 -99%) (100%)

5. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET NET _____ DRIFT NET _____
SEINE _____ OTHER (IDENTIFY) _____
ROD-AND-REEL _____

How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

6. How was subsistence salmon fishing for your household this year?

SALMON (CHUM): ____ VERY GOOD ____ AVERAGE ____ POOR IF POOR, WHY? _____

7. Did your household catch salmon for dog food?

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do **not** include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were the salmon caught for dog food included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

**1996 KOTZEBUE SOUND / NOATAK RIVER
SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)**

NON-FISHING HOUSEHOLDS (Household did not harvest/catch salmon)

11. Did your household help another household cut or hang salmon or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? Yes _____ No _____
If yes, please estimate how many salmon you received for your household.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

#13)

(Go to

COMMERCIAL FISHING

***13. Did your household commercial fish for salmon this year?** No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Are those salmon included in the estimates you already gave me? No _____ Yes _____

TROUT/CHAR FISHING

***17. Did your household catch trout (char) for subsistence use this year?** No _____ (Go to #20) Yes _____

18. Please estimate how many trout (char) your household caught for subsistence use this year (your share of the catch if fishing with others). Include trout you caught and gave away or lost to spoilage. _____

19. How was trout fishing this year?
____VERY GOOD ____AVERAGE ____POOR IF POOR, WHY? _____

***20. In your opinion, what could Fish and Game do to make subsistence salmon fishing better?**

***21. Do you have any other suggestions or comments?**

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.
A summary of this subsistence fishing survey will be sent to you next spring (April).

COMM. ID# _____
HHID# _____

KOBUK RIVER AREA

1997 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

***Household Size** _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon? No ____ Yes ____**

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

KOBUK RIVER AREA

1997 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

*17. Did your household catch sheefish or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMM. ID# _____
HHID# _____

NOATAK RIVER AREA

1997 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

NOATAK RIVER AREA

1997 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

KOBUK RIVER AREA

1998 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

***Household Size** _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon? No ____ Yes ____**

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

KOBUK RIVER AREA

1998 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

*17. Did your household catch sheefish or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

NOATAK RIVER AREA

1998 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

NOATAK RIVER AREA

1998 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

KOBUK RIVER AREA

1999 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

***Household Size** _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon? No ____ Yes ____**

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

KOBUK RIVER AREA

1999 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

*17. Did your household catch sheefish or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

NOATAK RIVER AREA

1999 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

Was household in community last year? No ____ Yes ____

If no, where were you living? _____

Household P.O. Box (if new): _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No ____ Yes ____

***2. Does your household usually subsistence fish for salmon?** No ____ Yes ____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

4a. How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No ____ Yes ____

6. How was subsistence chum salmon fishing for your household this year?

____ VERY GOOD ____ AVERAGE ____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No ____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ____ (Go to #13) Yes ____ (Go to #8)

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No ____ Yes ____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

NOATAK RIVER AREA

1999 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

KOBUK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

***Household Size** _____

Interviewer: _____

If new household, where were you living last year? _____

(If new household) P.O. Box: _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No _____ Yes _____

***2. Does your household usually subsistence fish for salmon? No _____ Yes _____**

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?

_____ VERY GOOD _____ AVERAGE _____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No _____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish _____ (Go to #13) Yes _____ (Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No _____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

KOBUK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

*17. Did your household catch sheefish or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

NOATAK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

If new household, where were you living last year? _____

(If new household) P.O. Box: _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No _____ Yes _____

***2. Does your household usually subsistence fish for salmon? No _____ Yes _____**

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?

_____ VERY GOOD _____ AVERAGE _____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No _____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish _____ (Go to #13) Yes _____ (Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No _____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

NOATAK RIVER AREA

2000 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

KOBUK RIVER AREA

2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

***Household Size** _____

Interviewer: _____

If new household, where were you living last year? _____

(If new household) P.O. Box: _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No _____ Yes _____

***2. Does your household usually subsistence fish for salmon?** No _____ Yes _____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?

_____ VERY GOOD _____ AVERAGE _____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No _____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish _____ (Go to #13) Yes _____ (Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No _____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

KOBUK RIVER AREA

2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

SHEEFISH AND WHITEFISH FISHING

*17. Did your household catch sheefish or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many sheefish and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

SHEEFISH _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# _____
HHID# _____

NOATAK RIVER AREA

2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY

* Questions marked with an asterisk are asked of all households interviewed

Community: _____

Household Head Name: _____

Survey Date: _____

*Household Size _____

Interviewer: _____

If new household, where were you living last year? _____

(If new household) P.O. Box: _____

***1. Did your household catch salmon for subsistence use or with a rod-and-reel this year?**

No _____ Yes _____

***2. Does your household usually subsistence fish for salmon?** No _____ Yes _____

FISHING HOUSEHOLDS ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET _____ SEINE _____
ROD-AND-REEL _____ DRIFT GILL NET _____

- 4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? No _____ Yes _____

6. How was subsistence chum salmon fishing for your household this year?

_____ VERY GOOD _____ AVERAGE _____ POOR If POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

No _____ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish _____ (Go to #13) Yes _____ (Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the estimates you already gave me? No _____ Yes _____

10. How many dogs does your household have? _____ (Go to #13)

HHID# _____

NOATAK RIVER AREA

2001 SUBSISTENCE SALMON HOUSEHOLD HARVEST SURVEY (CON'T)

NON-FISHING HOUSEHOLDS ("No" to #1)

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No _____ (Go to #13)
Yes _____

12. Did you receive salmon in exchange for your help? No _____ Yes _____

If yes, please estimate how many salmon you received for your household. (Do not include fish from a F&G test net.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No _____ (Go to #17) Yes _____
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold _____ (Go to #17) Some used for subsistence _____

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the estimates you already gave me? No _____ Yes _____

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No _____ (Go to #19) Yes _____

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

THANK YOU FOR YOUR TIME AND FOR HELPING WITH THIS PROJECT.

A summary of this subsistence fishing survey will be sent to you next spring (April).

COMMUNITY ID# 250
HH ID# _____

2002 SUBSISTENCE SALMON HARVEST SURVEY NOATAK

* Questions marked with an asterisk are asked of all households interviewed

Survey Date: _____
Interviewer: _____

*Household Size _____
(If new household) P.O. Box: _____

***1. Did your household fish for salmon for subsistence use this year (including with a rod-and-reel)?**

YES ☐ NO ☐
(Go to #2, then to #3) (Go to #2, then to #11)

***2. Does your household usually subsistence fish for salmon?**

YES ☐ NO ☐

If Household Subsistence Fished for Salmon ("Yes" to #1):

3. Please estimate how many salmon your household caught for subsistence use or with a rod-and-reel this year (your share of the catch if fishing with others). Include salmon you gave away, ate fresh, lost to spoilage, or obtained from helping others process fish.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

4. What type(s) of fishing gear did your household use for catching subsistence salmon this year?

SET GILL NET ☐ SEINE ☐
ROD-AND-REEL ☐ DRIFT GILL NET ☐

- 4a. (If rod-and-reel was used) How many salmon did your household catch and keep with rod-and-reel this year?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

5. Did your household give salmon to other households this year? NO ☐ YES ☐

6. How was subsistence chum salmon fishing for your household this year?

VERY GOOD ☐ AVERAGE ☐ POOR ☐ IF POOR, WHY? _____

7. Did your household catch salmon specifically for dog food? (Using salmon for dog food is allowed by regulations.)

NO ☐ (Go to #13) Only backbones/heads/guts/scraps/spoiled fish ☐ (Go to #13) YES ☐ (Go to #8)

If Household Fished for Dog Food:

8. How many salmon did your household catch for dog food? (Do not include fish lost to spoilage and fed to dogs.)

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

9. Were these salmon included in the harvest estimates you gave me in #3? NO ☐ YES ☐

10. How many dogs does your household have? _____ (Go to #13)

HH ID# _____

2002 SUBSISTENCE SALMON HARVEST SURVEY (CON'T)

If Household Did NOT Subsistence Fish for Salmon ("No" to #1):

11. Did your household help another household fish, cut or hang salmon, or process it some other way? No ☐ (Go to #13)
Yes ☐

12. Did you receive salmon in exchange for your help? No ☐ Yes ☐

(If yes) Please estimate how many salmon you received for your household.

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

(Go to #13)

COMMERCIAL FISHING

*13. Did your household commercially fish for salmon this year? No ☐ (Go to #17) Yes ☐
If yes, where? _____

14. Were all of the salmon you caught when commercial fishing sold or were some brought home to eat or processed for subsistence? All sold ☐ (Go to #17) Some used for subsistence ☐

15. How many commercially caught salmon did your household use for subsistence?

CHUM _____ CHINOOK _____ PINK _____ SOCKEYE _____ COHO _____ UNKNOWN SALMON _____
("DOGS") ("KINGS") ("HUMPIES") ("REDS") ("SILVERS")

16. Were these salmon included in the harvest estimates you gave me in #3? No ☐ Yes ☐

TROUT (CHAR) AND WHITEFISH FISHING

*17. Did your household catch trout or whitefish for subsistence use this year? No ☐ (Go to #19) Yes ☐

18. Please estimate how many trout and whitefish your household caught for subsistence use this year (your share of the catch if fishing with others). Include fish you caught and gave away, ate fresh, lost to spoilage, or fed to dogs.

TROUT _____ WHITEFISH _____

*19. Do you have any suggestions or concerns about subsistence fishing?

KOTZEBUE SOUND 2003 SUBSISTENCE SALMON HARVEST SURVEY

Alaska Department of Fish and Game

Community ID# _____

HH ID# _____

Community: _____

Survey Date: _____

Interviewer: _____

Household Size: _____

(If new household) PO Box: _____

Household participation is voluntary. Individual household data will not be released without permission of household head

1. Did your household fish for salmon for subsistence use this year (including with a rod and reel)? ☐ YES ☐ NO
2. Does your household usually subsistence fish for salmon? ☐ YES ☐ NO

FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use this year, including with a rod and reel. It is important not to double count fish harvests. Report only your share of the catch if fishing with others. Include salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or obtained from helping others process fish.

SPECIES	NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED			
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD AND REEL (Number of fish)	Salmon Kept From Commercial Fishing (Number of fish)	Of your total harvest, how many salmon were caught specifically for dog food?
CHUM SALMON Dog				
CHINOOK SALMON King				
PINK SALMON Humpy				
SOCKEYE SALMON Red				
COHO SALMON Silver				

4. How was subsistence chum salmon fishing for your household this year?

☐ Very Good ☐ Average ☐ Poor If poor, why? _____

5. Did your household give salmon to other households this year? ☐ YES ☐ NO

Susan Georgetown, ADFG, 442-3420

Division of Subsistence, Kotzebue

Community ID# _____
HH ID# _____

KOTZEBUE SOUND 2003 SUBSISTENCE SALMON HARVEST SURVEY (CON'T)

6. Did your household fish for sheefish, whitefish, or trout for subsistence use this year? ☐ YES ☐ NO

If yes, please estimate how many fish your household caught for subsistence use this year. Report only your share of the catch if fishing with others.
Include fish you gave away, ate fresh, fed to dogs, or lost to spoilage.

NUMBER OF FISH YOUR HOUSEHOLD HARVESTED		
SHEEFISH (Number of fish)	WHITEFISH (Number of fish)	TROUT (CHAR) (Number of fish)

7. Do you have any suggestions or concerns about subsistence fishing?

Division of Subsistence, Kotzebue

THANK YOU!

Susan Georgetown, ADFG, 442-3420

KOTZEBUE SOUND 2004 SUBSISTENCE SALMON HARVEST SURVEY

Alaska Department of Fish and Game

Community ID# _____

HH ID# _____

Community: _____

Survey Date: _____

Interviewer: _____

Household Size: _____

(If new household) PO Box: _____

Household participation is voluntary. Individual household data will not be released without permission of household head

1. Did your household fish for salmon for subsistence use this year (including with a rod and reel)? ☐ YES ☐ NO
2. Does your household usually subsistence fish for salmon? ☐ YES ☐ NO

FOR SALMON FISHING HOUSEHOLDS ONLY ("Yes" to #1)

3. Please estimate how many salmon your household caught for subsistence use this year, including with a rod and reel. It is important not to double count fish harvests. Report only your share of the catch if fishing with others. Include salmon you gave away, ate fresh, fed to dogs, lost to spoilage, or obtained from helping others process fish.

SPECIES	NUMBER OF SALMON YOUR HOUSEHOLD HARVESTED			
	SUBSISTENCE GILL NET or SEINE (Number of fish)	ROD AND REEL (Number of fish)	Salmon Kept From Commercial Fishing (Number of fish)	Of your total harvest, how many salmon were caught specifically for dog food?
CHUM SALMON Dog				
CHINOOK SALMON King				
PINK SALMON Humpy				
SOCKEYE SALMON Red				
COHO SALMON Silver				

4. How was subsistence chum salmon fishing for your household this year?

☐ Very Good ☐ Average ☐ Poor If poor, why? _____

5. Did your household give salmon to other households this year? ☐ YES ☐ NO

Susan Georgetown, ADFG, 1-800-478-3420

Division of Subsistence, Kotzebue

Community ID# _____
HH ID# _____

KOTZEBUE SOUND 2004 SUBSISTENCE SALMON HARVEST SURVEY (CON'T)

6. Did your household fish for sheefish, whitefish, or trout for subsistence use this year? ☐ YES ☐ NO

If yes, please estimate how many fish your household caught for subsistence use this year. Report only your share of the catch if fishing with others.
Include fish you gave away, ate fresh, fed to dogs, or lost to spoilage.

NUMBER OF FISH YOUR HOUSEHOLD HARVESTED		
SHEEFISH (Number of fish)	WHITEFISH (Number of fish)	TROUT (CHAR) (Number of fish)

7. Do you have any suggestions or concerns about subsistence fishing?

Susan Georgetown, ADFG, 1-800-478-3420

THANK YOU!

Division of Subsistence, Kotzebue